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THE RADIOLOGIC ASPECT OF THE UROLOGIC PROBLEM

CHAIRMAN'S ADDRESS

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CHICAGO

A decade and a half ago, intravenous or excretory urography was introduced by Swick [1] and von Lichtenberg,[2] who simultaneously published the results of their investigations with iopax (uroselectan) and its action with reference to the urinary tract in the *Klinische Wochenschrift* in November 1929. This work received confirmation from Heritage and Ward [3] early in 1930 in England and was soon further confirmed in this country by a host of investigators. The value of the procedure was quickly recognized, and it was promptly adopted as a routine examination. The usual difficulty of obtaining an adequate source of supply of the necessary drug was rapidly overcome. From an initial dose, intravenously given, of 300 cc. administered by using six 50 cc. syringes or by buret, our chemical confrères shortly were able to develop a satisfactory solution so concentrated that it could be put up in 20 cc. sterile ampules, making the method available to the profession at large. The success of the method depended on the excretion of an iodine fast radical, with the urine, from the kidneys. This made it possible to outline the urinary tract, since the iodine radical gave a density to the excreted urine almost comparable to retrograde pyelographic mediums. At first the iodine content was not sufficient to cast entirely satisfactory shadows, but today, with intravenous solutions available with an iodine content of from 40 to 70 per cent, very satisfactory results are produced.

The method of making this examination is now too well known to warrant a detailed explanation. Let it suffice to say that it is simple and safe if a few precautions are observed. Our standard routine is to start with a scout film or a KUB film. The patient is thoroughly purged the evening before and the intravenous injection is made the following morning, without breakfast. We feel that purging is exceedingly important, for an intestinal tract full of food or feces can well interfere with proper visualization of even large calcific stones in the kidney, ureter or bladder. This was again impressed on us recently when a scout or survey film, taken just prior to an intended examination, showed a large stone in the left ureter, but because of intestinal contents small stones in the lower calix of each kidney were not visualized. (This patient was not prepared.) Fortunately, since we make it a routine practice never to proceed beyond the scout film examination unless we feel that the entire urinary tract is satisfactorily visualized, these stones were revealed without difficulty in another KUB film after adequate preparation. After a satisfactory scout film has been obtained, our routine consists of roentgenograms made at five, fifteen and thirty minutes. We feel, however, that each case is a law unto itself, and therefore each film is checked, after development, and the routine changed accordingly, if necessary, with exposures made at varying intervals even up to twenty-four hours. Routine is maintained only in cases which are obviously normal.

The method is not without its difficulties and hazards. Severe reactions have been encountered after injection of the medium, with a few fatalities, patients who died apparently as a direct result of the intravenous injection. Pendergrass reported a series of twenty-six deaths out of approximately 661,800 cases, in addition to 11 previously reported. However, an analysis of his survey would indicate that only ten of these twenty-six deaths occurred directly as a result of the procedure. It is true that the other 16 patients had had an excretory urography done, but the statistics would indicate that they undoubtedly died from some other concurrent condition rather than that their deaths were due per se to the method. Pendergrass's figures show that in his series of cases, including the entire 26, only 0.0039 per cent showed a lethal reaction. If one can eliminate sixteen of the deaths classified as delayed, in which there is a question as to the cause of death being the intravenous medium, then the actual figures are exceedingly low, somewhere in the neighborhood of 0.0014 per cent, instead of 0.0039 per cent, as claimed. Other reactions are fairly common, such as flushing, nausea, urticaria, itching, venospasm, pain in the shoulder, sense of constriction in the pharynx, phlebitis and cerebral irritation. Hypersensitivity simulating anaphylactic shock may also be present. It appears, from the literature and from personal contact with radiologists, that the present methods of preexamination sensitivity tests, such as making an intradermal, mouth or conjunctival test, regardless of whether they are negative or positive, are not satisfactory criteria as to whether the patient will or will not react to the application of the drug. It is my understanding that the reactions which have occurred have been due more to extraneous material contained in the glass ampules than to the solutions per se, and this has now been rectified. I agree entirely with the suggestion of Pendergrass that in each room where the urographic study is to be made a tray should

Read before the Section on Radiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1. Swick, M.: Darstellung der Niere und Harnwege im Röntgenbild durch intravenöse Einbringung eines neuen Kontraststoffes, des Uroselectans, Klin. Wchnschr. **8**: 2087, 1929.
2. von Lichtenberg, A., and Swick, M.: Klinische Prüfung des Uroselectans, Klin. Wchnschr. **8**: 2089, 1929.
3. Heritage, K., and Ward, R. O.: Excretion Urography, Brit. M. J. **1**: 734, 1930.

be available containing epinephrine 1:1,000, atropine sulfate, caffeine with sodium benzoate and sterile hypodermic syringes for immediate use if necessary. It seems, however, that in the past several years, while reactions more or less severe have occurred, no lethal sequelae have been reported.

The method appears to be a safe one, barring unforeseen allergic or chemical reactions, which might apply to any medication or preparation given intravenously.

Due consideration must be given to contraindications, and extreme care must be employed in using contrast mediums for patients with "severe liver disorders, nephritis, exudative diathesis and severe uremia."[4] Also the method should be used with caution for patients with pulmonary tuberculosis, hyperthyroidism or hypertension and for patients with a history of allergy.

The usefulness of excretory urography is immediately apparent when one considers the cases in which a study of the urinary tract is indicated but the passage of the cystoscope or of shadowgraph catheters is impossible, contraindicated or undesirable. The value of excretion urography was immediately realized. Here we had a method particularly adaptable in those cases in which we were dealing with pin point ureteral orifices, many times impossible to locate in the bladder, or, having passed a catheter, to meet suddenly an apparent ureteral obstruction, finding it impossible to pass the catheter up into the renal pelvis. Another group of cases which give the urologist difficulty in retrograde pyelography are those of ureteral stricture, a small urethral meatus, prostatic hypertrophy, severe bladder hemorrhage or fistula, in which ureteral catheterization is impossible or contraindicated. Without excretory urography it is almost impossible to determine the presence of certain genitourinary diseases or anomalies in young children and infants. While I feel today that bilateral simultaneous retrograde pyelography is a safe procedure, especially when using the same contrast medium that is injected intravenously, many urologists still hesitate to make this type of examination. Many radiologists still hesitate to make this type of examination and consequently fail to examine the opposite, apparently normal, kidney. It is good, sound practice to visualize the unsuspected kidney whenever possible, but to obtain information relative thereto necessitates a second catheterization, which is not always desirable. Excretory urography may supply this information. In woman, pressure on the bladder by an enlarged uterus due to fibroids, pregnancy or the like, or pressure from altered pelvic adnexa, makes it difficult or impossible to pass a shadowgraph catheter, and here again excretory urography may prove to be a very satisfactory method of determining the status of the urinary tract.

Those conditions which have been well shown in a characteristic manner by excretory urography include the positive findings of pyonephrosis, hydronephrosis, ureteropelvic kinks with obstruction, due to aberrant vessels or adhesions at the ureteropelvic junction, with obstruction anywhere in the ureter, renal tuberculosis, polycystic kidney, traumatic kidney, congenital absence of a kidney, ectopic kidney, neoplasm, horseshoe kidney, double renal pelves, double ureters, radiolucent calculi in either the kidney, ureter or bladder, ureteral polypi, hypernephroma, anomalies, carcinoma of the bladder or tuberculosis of the bladder. Excretory urography, however, is not entirely a substitute for retrograde catheterization with pyelography, but there are many occasions on which it elicits certain information obtainable in no other way. Many cases in which cystoscopy and the passage of shadowgraph catheters are contraindicated can be easily handled by the new method, and information can be gleaned that would otherwise be impossible to secure. On the other hand, intravenous pyelography alone is often sufficient and, in addition, gives a good idea of renal function.

An important diagnostic factor, not commonly considered, is the differential diagnosis of shadows in the right upper quadrant, especially between gallstones and renal calculi. These stones often simulate one another in their structure and density. When this occurs, proper rotation films following excretory urography may differentiate one from the other. If there is a gallstone present, it is invariably possible to rotate this shadow entirely out of and away from the kidney contour, thereby definitely ruling it out as a renal calculus.

It is of the utmost importance that the radiologist and the urologist collaborate to the fullest possible degree to obtain the best results from excretory urography. It is only by close team work between the two that the best interests of the patient are conserved, and the closer the liaison the more the value of the procedure. The radiologist should have at his command the history and the laboratory findings and, in the light of these latter, many times he may suggest additional films, under different conditions, the nature of which he has learned through his appreciation of the reaction of normal renal anatomic and gross pathologic conditions of the urinary system, when subjected to the influences of opaque mediums.

SUMMARY

It may be of value to call attention to a few fundamental maxims of urinary tract examination which it might be well to bear in mind:

1. Proper and adequate preparation of the gastrointestinal tract is an essential prerequisite to satisfactory roentgenograms of the urinary tract.

2. An ideal roentgenogram of the urinary tract is one which shows the detail, including the kidney outlines.

3. The kidneys are too often obscured by material in the gastrointestinal tract, which may be so dense as completely to vitiate stone shadows.

4. Failure to visualize a urinary calculus (KUB films) does not signify that a stone may not be present. There are radiolucent calculi that cast no shadow.

5. Even a large calcific ureteral stone may not register a shadow on the film when it lies over the ala of the sacrum. Even large calculi in this location have been missed.

6. A scout film of the urinary tract is usually only the first step in a proper x-ray examination.

7. There is no controversy between excretory urography and retrograde pyelography. Either one or the other, with a scout film, or all three combined, may be necessary before a satisfactory result can be obtained.

8. It is as important to visualize the normal renal pelvis as the pelvis of the suspected kidney.

4. Pendergrass, E. P.; Chamberlain, G. W.; Godfrey, E. W., and Burdick, E. D.: A Survey of Deaths and Unfavorable Sequelae Following the Administration of Contrast Media, Am. J. Roentgenol. **48**: 754 (Dec.) 1942.

9. The use of modern intravenous pyelographic mediums for bilateral simultaneous retrograde pyelography has made the procedure a safe one.

10. A suspect stone shadow, apparently in contact with a shadowgraph catheter, may prove to be outside the ureter or kidney, when rotation films are made.

11. Do not judge stone shadows in the right upper quadrant and within the kidney outline too hastily. They may prove to be gallstones.

12. Lack of excretion (excretory urography) from one kidney does not necessarily mean a "dead kidney." A small stone in the ureter may produce a calculous anuria, even though the stone may not be visualized. It has been noted that renal function has been restored within five minutes after a ureteral calculus has been passed into the bladder.

With reasonable precaution excretory urography, in experienced and competent hands, is a safe and valuable procedure, and one which frequently gives information obtainable in no other way.

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THE MEDICAL DIRECTION OF HUMAN DRIVES IN WAR AND PEACE

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The greatest challenge which faces the medical profession today, in my opinion, is the physical and psychologic rehabilitation of the returning war veteran as a member of his community.

Three years ago the medical profession was called on to mobilize its ranks for service in the armed forces. We did so. How well we met that challenge is being demonstrated in the high quality of medical service we are delivering every day on every front. This was a second challenge—the performance of our mission as doctors at war—and we shall continue to accept it and concentrate our energies on war medicine until the last wound is healed.

In the Army Air Forces, however, we have accepted rehabilitation, psychologic as well as physical, as a function of war medicine. Our Convalescent Training Program has proved that this task should begin as soon as the soldier is hospitalized and should continue without interruption until he is able, and knows he is able, to resume a useful life as a soldier or a civilian. Our success in this direction, which places the primary responsibility for rehabilitation within the military organization, has demonstrated that the over-all problem of human reconversion—the task of converting soldiers back to citizens—is not waiting an end of war. They are returning in thousands from the beachheads of Salerno, Anzio, Tarawa, Normandy and Saipan and from the airdromes of England, Italy, Burma and the Pacific. For many of these sick and wounded the war is already over. This current situation may be regarded as a pilot run on the immense rehabilitation project to come when millions of war veterans are restored to civilian environment.

By this I do not mean that millions will be disabled. The physically handicapped will be numerous, too numerous, unfortunately. The job of physical restoration and mental readjustment of the physically disabled is clearcut. It is being tackled in an organized and effective manner by the Army, the Navy, the Veterans Administration, the American Medical Association and the many civilian and government agencies associated in the Baruch Committee on Physical Medicine.

Read before the Kentucky State Medical Association and Wartime Medical Graduate Meeting, Lexington, Ky., Sept. 19, 1944.

THE PROBLEM OF RAHABILITATION

My point is that, in comparison to those with outright disabilities, a far greater proportion of our returning war veterans will be able bodied but psychologically different from the civilians who left their communities to enter military service two, three or four years before. They have different attitudes, different feelings, different emotions, different drives, and they present a problem of rehabilitation which is complicated and obscure. The nature of their problem is difficult to understand and complex in its solution. While these differences in behavior fall within the field of psychiatry, they do not apply merely to the neuropsychiatric casualty—the case of frank war neurosis, or operational fatigue, as it is known in the AAF. More specifically, I am speaking of the war veteran who would be classed as normal by any ordinary physical or mental standard but whose attitudes and drives have been altered by the impact of war.

From the time he was inducted, this man's foremost desire has been to get home again. He carries it through the rigors of training and the terrors of battle. He is nonetheless loyal and he fights nonetheless well because of his human yearning to go home. But when he goes, when he is again among his relatives and his friends in his home town, he may be engulfed with the feeling that everything is changed, that he somehow has been cheated. He feels disappointed, disillusioned, depressed and dissatisfied. He may be tense and restless and even wish he was back in combat. His lost feeling may express itself in an attitude of resentment and hostility toward the people and the community he loves. He may come to feel more like a victim of these people than their hero.

What has happened to this man is not hard to understand. It has received some public attention, but the story needs to be made a part of a national educational campaign. Such a program must start with the elimination of the widespread misunderstanding which exists in the mind of some physicians as well as the general public as to the significance of terms like "psychoneurosis" and "neuropsychiatric casualty" and as to the nature of military psychiatry. In the first place, for most of us physicians the methods of psychiatry seem mysterious, esoteric and incomprehensible. Where other medical specialists may see and palpate the hernia by physical examination, find a kidney stone or an ulcer by reading an x-ray film or identify typhoid by a bacteriologic test, the psychiatrist can diagnose a functional disturbance of the central nervous system only by a qualitative analysis of changes in the patient's behavior and personality. While to most of us this interpretation of illness from actions and reactions seems an intangible way of making a medical diagnosis, you will see, if you think about it, that it is a social practice in which we indulge every day. Constantly we are judging one another by the deviations of the subject's conduct from the conventional. We reach glib conclusions that Joe is "a crazy guy" or Jack "acts funny."

But we accept them and maybe even admire them. We excuse the man who has a spell of being crabby, jittery, seclusive, bellicose or eccentric as being somehow different than usual and let it go at that. But if Joe or Jack goes to a psychiatrist we may change our minds, because psychiatrists are commonly identified with the treatment of the mentally disordered and unbalanced, and we think that any one who needs a psychiatrist must be pretty badly off. All of us, of course, have an instinctive distrust and aversion for the insane. Actually, the psychiatrist probably agrees with us that Joe or Jack "acts funny," but he calls it a psychoneurosis or functional nervous disorder, which to him doesn't even imply a psychosis or insanity. But the damage is done because the person is in the hands of a psychiatrist, and Joe or Jack is tagged with a name which the American public has come to think of in terms of weakness.

This impression makes it difficult for the public to believe that soldiers who have been labeled as "NP"—or neuropsychiatric—are no different from other people who get the jitters or become upset in difficult and harassing situations. By any working standard these men were accepted as normal in their communities, which is the environment to which they usually are best adapted. Even those who were rejected for military service at the outset on neuropsychiatric grounds tend to fall within normal standards as far as their civilian environment was concerned. In it they were capable of making good social and occupational adjustments, but in a military environment of discipline, regimentation, insecurity and hardship they did not look like good fits. Outside of the comparatively small group of soldiers who were psychoneurotic or less frequently psychotic but were able to get by the induction examination, the war psychiatrist is dealing with a normal person in an abnormal environment.

This is the message that the physician, the relatives, the friends, the employer and the community of the war veteran should hear. Whether he is labeled a neuropsychiatric casualty or is discharged for some other reason or is merely home on leave, any differences in his behavior probably comprise a hangover from his normal reactions to an abnormal way of living—and dying.

What war has done is to call on this individual to accept the abnormal idea that self preservation is less important than self sacrifice—that there is a distinction between killing a man in peacetime and killing him in war. Conditioned throughout his formative years to seek security and comfort, to love peace and freedom, the raw recruit is quickly and brutally exposed to a system which, first in training and then in combat, subordinates his personal security to that of the group, continually replaces comfort with hardship and strain, offers him peace only as the distant reward for making war, and denies that freedom is preferable to authoritarian discipline and regulation.

It is difficult for the individual to adapt himself to this military deflation of his ego, to this superimposition of the group ego on, and frequently against, his will. All men are alike in that they have feelings and in that these feelings may run into emotional conflict with other feelings which are equally acceptable. In our fliers we have observed a number of basic conflicts. The most obvious is that of the fear of destruction conflicting with the compulsion to fight. The individual's instinct says flee, but the will of the group says fight. There is the very real conflict between one's sense of duty, or patriotism, and one's worries over one's wife and child. There is the conflict in the desire to stick by your friends in the squadron when your ego tells you to "save yourself." And there are conflicts arising from a feeling that your friend in the ball turret or in the wing position was killed because of some personal failing on your part. One of the most interesting conflicts observed in our fliers has nothing to do with the man's peacetime conditioning but with his complete acceptance of flight as a normal environment. He loves to fly. He is the "natural," and you will hear him say "Doc, I'd rather fly than eat." He means it. The airplane gives him a lift spiritually as well as aerodynamically. To get up there in the sky and look down on the earth inspires in him a sense of majestic freedom, a kinship with the gods. But a conflict arises from his discovery that, as the result of combat flying, the thing he loves seems bent on destroying him.

Can these soldiers who have faced tensions and stresses far beyond any peacetime demand on their organism be regarded as mentally suspect because they carry the anxieties they have developed in combat back home with them? You know the answer is no. They have reacted normally to an essentially inhuman environment and in most cases have made remarkably good adjustments to their military environment up to a point where no man could be expected to endure much more. They are not failures because they may have developed certain symptoms of anxiety. Each man has his individual tolerance point for military stress. The basic soldier, uprooted from the local environment and transplanted in the training camp, may not be able to make the adjustment. The flier, who has made every adjustment from the original load imposed on him in the aviation cadet center throughout the two years it takes him to complete his flight training, in a few instances may not be able to make the final adjustment to combat flying.

But the great majority of them do, and they fly their missions, twenty-five, fifty or more, carrying their anxieties into battle and out again. They are the strong and the successful. But when they have completed their tour of duty and returned to the United States, they bring their differences in behavior with them.

These men have been poured into a mold, the mold of war, and to remove them from it requires adjustments as profound as those they were forced to make when they changed from civilian to military environment. They present all degrees of difficulty in adjusting to the peaceful, prosaic and trivial circumstances of home life after learning to live in a fighting group which so orders their life that it can give all or take all with one word from one commander. One man, flexible, resilient, may come home, take his wife on a fishing trip and settle down to being "good old Bill" again without so much as a harsh word. Things are different, but he can "sweat" anything out. Another highstrung race horse of a man perhaps finds that the releases he found in combat are boiling over in hostility toward his mother's solicitation or in a desire to punch the nose of every civilian he sees on the street.

There will be every gradation in the changes which war has wrought in the behavior of these men, because of the differences in their drives, their conditioning, their physiology and their attitudes. Any man forced to conform to an environment in which he does not fit well develops nervous tension and therefore psycho-

neurotic symptoms. The greater the incompatibility between his personality and the environmental stresses, the greater the tension and the more severe his symptoms. The longer the stresses are continued, the more worn out he becomes from the tension.

The individual's personality can be described as having the characteristics of the curved leaf in a spring, such as found in an automobile. If the spring is forced to conform to a curve either greater or less than that to which it was molded, the spring is under tension. The greater the discrepancy from the natural curve, the greater the tension, and the more the steel is fatigued.

Like the various leaves in the spring, each individual has his own curve and will have to be bent in varying amounts to fit in the curve of tension imposed by combat. If the tension has been sufficient to fatigue his personality, he may be slow to spring back to the shape in which his original environment molded him.

This is the challenge we face each time a war veteran returns home—to see that he has full opportunity to spring back to his original personality curve. Given a little time and a little help, most of them will. The original curve of that spring is strong, and removal of abnormal stress and tension is curative in most cases. But the changes from an environment of tension to one of relaxation is a radical one and, in instances in which the fatigue of the personality has been great, special help must be given in making the adjustment.

What we are dealing with is the problem of fitting individuals into groups—individuals who express themselves in some sort of work—groups designed to produce in some fairly specific manner. Perhaps at first glance this does not seem like a medical problem. In the experience of the Army Air Forces it is. The AAF Medical Service has found a direct relationship between a man's health and the group to which he is assigned. If he is not doing the right job or the group is not doing its job, he tends to become unhappy and inefficient, and these characteristics may be manifested in various breakdowns in his health. If after breaking down he is not reoriented as a member of a productive group his recovery is slow and perhaps incomplete.

COMBAT FLYING

In dealing with the highly specialized occupation of combat flying, we have developed a program in aviation medicine which I feel introduces a new concept in medical practice or at least brings previously unrelated branches of science into a medical focus.

Our first interest in the flier is the matter of selection. Each candidate must have the physical capacity. The medical examination for flying performed by the flight surgeon emphasizes not only general mental and physical fitness but also normal function in vision, hearing, equilibrium and personality. Each man must also have the psychologic aptitude for learning to fly. Our aviation psychologists have developed the most comprehensive mass psychologic testing program in history—all for the purpose of fitting the individual into the occupational group where he has the greatest chance of succeeding. This wartime demonstration indicates that an entire industry or even an entire nation could make progress by determining an individual's physical capacity and psychologic aptitudes and then training him for the task for which he is best fitted.

Our second interest in the flier is the preservation of his physical and psychologic fitness to fly. A flight surgeon is assigned to each squadron. The flight surgeon, through his participation in the working environment of his patients, occupies a position which is rather unique in medicine, although it has some precedent both in the country doctor, who was a power in his community, and in the industrial surgeon, who is interested in occupational diseases and hazards. One of the flight surgeon's main interests is the prevention of operational fatigue, the occupational disease of the flier. The syndrome of operational fatigue, made up of a composite of emotional and fatigue symptoms, is a product of chronic tension and physical tiredness manifesting itself in a state of anxiety. It is a destroyer of individual efficiency and laterally group morale. Any contribution to morale aids in the prevention of operational fatigue, and nothing contributes more to morale than good leadership. The fitness of the individual for his job depends on physical capacity and psychologic aptitude, but the fitness of a group of fit individuals depends more than anything else on the intelligence manifested by the leadership in directing the group toward the logical utilization of its abilities. It has been one of the most profound observations of the war, I think, that not only the efficiency but also the health of a group is affected by the quality of leadership. Medical officers have observed both in the Air Corps and in the Infantry that weak leadership is reflected in a high neuropsychiatric casualty rate and strong leadership in a low rate. Thus you see that treating the sick individual is secondary to the function of treating the healthy group so that its members will not become sick.

Our final interest in the flier is the restoration of his physical capacity and psychologic aptitude for productive work after he has become sick. This is the function of the AAF Convalescent Training Program. We operate five convalescent hospitals where the flier returning from combat with a physical disability or, with operational fatigue may be given the special attention needed for his rehabilitation. The first objective is to salvage him for further military service for he, after all, is the man who was a success and not a failure in his military occupation. If it is not possible to rehabilitate him for resumption of flying duty, an attempt is made to retrain him for ground duty. Only as a last resort is he discharged back to civilian life. If this is necessary, every effort is made to prepare him for this change of environment.

Convalescent training is fourfold in its approach. It aims at physical reconditioning, psychiatric restoration, vocational reorientation and resocialization. If it's a job the man is worrying about, we help him find a job to his liking. If he has a family problem, we try to work it out with his wife. In fact, because of the husband-wife problems rising out of changes in the patient's behavior, we have established orientation courses for wives of returning war veterans.

As an example of what can be done if the group makes an effort to rehabilitate its own members, I will cite results obtained at one of our convalescent hospitals in a series of cases of severe operational fatigue. By severe I mean that these individuals returned from successful completion of their combat tours with such symptoms as restlessness, tension, tremor, overactivity of the sympathetic nervous sys-

tem, psychosomatic disturbances, anxiety states, phobias, depression, guilt reactions, inability to concentrate, mental confusion, weight loss, insomnia, battle dreams, irritability, startle reactions, loss of appetite or aggressive impulses. All were in need of psychiatric treatment in addition to rest, physical reconditioning and general reorientation. The results among officer flying personnel was restoration of 61 per cent to full flying duty, 8 per cent to limited flying duty and 27 per cent to ground duty. This made a total of 96 per cent rehabilitated in military service. Owing to less incentive, the full flying duty restorations among the enlisted flying personnel were much lower: 28 per cent. An additional 6 per cent were restored to limited flying duty and 48 per cent sent back to ground duty, making a total of 82 per cent rehabilitated in military service.

In considering these results it should be noted that in a psychiatric case the individual's desires are an important factor in deciding whether he should fly again or not. The fact that two thirds of the flying officers and one third of the enlisted men who had suffered severely from the stresses of their combat environment are willing to go back is significant of the potentialities of a medical approach based on the relation of the individual's capacities and aptitudes to the occupational group. After all, these men had made their sacrifice, and it might be expected that none of them would care to return to an environment which had caused them distress. I believe that a great many of our fliers, once the end of the war has relieved them from the abnormal tensions of combat, will realize that they are completely conditioned to a flying environment. They will then be normal men in normal environments.

REDIRECTION OF ENERGIES FROM WAR TO PEACE

As for the rest, we have directed the drives of these war veterans into winning a war and now face the responsibility of redirecting their energies into peace. You may feel that this war veteran is the problem of somebody else—of the psychiatrist, the psychologist, the sociologist. He is, indeed, their problem, but he is everybody's problem—the problem of his government, his community, his employer, his relatives, his friends and his doctor. No one should be better qualified by reason of scientific training and humanitarian interest than the physician to give direction to a national program which will redirect the drives of these men into socially constructive, individually satisfying channels.

The medical profession, I am convinced, has a profound opportunity stemming from the task of reorienting these men in their group. This is the development of a new type of preventive medicine seeking to improve the individual's health and efficiency by his orientation in an intelligently directed group in which he has the aptitude and desire to work. In this field, which we may for the moment call industrial community medicine, lies the challenge of transplanting to the soil of civilian industry some of the constructive discoveries we have made in the prosecution of a technological war.

In reality, the family doctor now becomes the specialist, and strangely enough his specialty has already been defined in medical terminology. He is a specialist in orthergasia, which literally means the conditioning of man to normal function and adjustment.

Headquarters, Army Air Forces.

PENICILLIN IN OPHTHALMOLOGY

LIEUTENANT COLONEL JOHN E. L. KEYES
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After the accidental discovery by Fleming [1] in 1929 of the inhibitive effect of penicillium mold on staphylococci in vitro, no effort was made to apply this knowledge in a clinical way until the studies begun by Howard W. Florey and his co-workers in 1940. Since then the organic acid formed by Penicillium notatum and named penicillin has been extensively investigated.

Observations on the use of penicillin in the treatment of ocular diseases in man have been published by Abraham,[2] the Floreys,[3] Keefer,[4] Mary Florey,[5] Keyes,[6] Sorsby,[7] Lyons,[8] Griffey [9] and Cashell.[10]

Material for this communication was derived from the special penicillin research center at Bushnell General Hospital, from private communications of medical officers of the Army and from medical literature on penicillin. No effort was made to compile statistics by treating a number of similar cases with penicillin. Research, which was essentially clinical, was directed toward establishing the sphere of usefulness of penicillin as an ophthalmic drug. The information presented in this report is tentative and subject to modification as our knowledge of penicillin increases.

More than 20 bacteria clinically sensitive to penicillin have been described. The following penicillin sensitive pathogens are encountered in ocular diseases: Streptococcus alpha, beta and gamma, Staphylococcus aureus and albus, Neisseria gonorrhoeae, Neisseria intracellularis meningitidis, Neisseria catarrhalis, Pneumococcus, Corynebacterium diphtheriae (mitis), Clostridium welchi, Actinomyces bovis, Treponema pallidum and diphtheroids. Grouped according to penicillin sensitivity, the most highly sensitive organisms are the (beta) hemolytic streptococci, gonococci and some strains of staphylococci. Streptococcus viridans (alpha), Streptococcus anhemolyticus (gamma) and the remaining organisms named are less sensitive. Staphylococci vary from extreme sensitivity to extreme resistance. Resistant strains are frequently found in skin and superficial wounds. Coagulase positive staphylococci are presumed pathogenic.

It has been observed by Walker [11] in mixed infections, in which organisms resistant to penicillin are

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Read in a symposium on "The Use of Penicillin in the Treatment of Diseases of the Eye, Ear, Nose and Throat" before the joint meeting of the Section on Ophthalmology and the Section on Laryngology, Otology and Rhinology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

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9. Griffey, W. P.: Penicillin in the Treatment of Gonorrheal Conjunctivitis: Report of a Case, Arch. Ophth. **31**: 162 (Feb.) 1944.
10. Cashell, G. T. W.: Treatment of Ocular Infections with Penicillin, Brit. M. J. **1**: 420 (March 25) 1944.
11. Walker, J. M.: Personal communication to the author.

present with organisms sensitive to penicillin, that the destruction of the sensitive bacteria by penicillin aided in the healing process if the sensitive bacteria were virulent pathogens. If the resistant bacteria were responsible for the virulence of the infection, penicillin therapy was less beneficial.

APPRAISAL OF PENICILLIN

Great care has to be exercised in appraising the efficacy of penicillin in a given ocular infection. The unavoidable error of clinical observation is high. Many ocular diseases are self limiting. Any therapeutic agent employed in such a disease may be credited erroneously with expediting recovery or causing a cure. Two illustrative cases are described:

A case of acute bilateral conjunctivitis secondary to nonhemolytic Staphylococcus albus and Koch-Weeks bacillus was treated by instillations of penicillin 1,000 units per cubic centimeter in one eye and 3 per cent solution of sodium sulfathiazole in the second eye. Negative cultures and a clinical cure were obtained in seven days. The staphylococcus was sensitive to both drugs; the Koch-Weeks bacillus was resistant to both drugs. A second case of bilateral acute conjunctivitis secondary to hemolytic Staphylococcus albus, coagulase negative, was treated in a similar manner. Conjunctival cultures were negative in four days, and clinical recovery was achieved in nine days. The result in these 2 cases of acute conjunctivitis offered little choice between the use of penicillin and of sodium sulfathiazole. Both patients were hospitalized. Sodium sulfathiazole probably would have been the drug of choice in office practice.

Penicillin is the drug of choice in the treatment of gonorrheal ophthalmia. The Floreys [3] had startling success with penicillin in a case of gonococcic ophthalmia neonatorum. "The gonococcal case of ophthalmia neonatorum had shown no response to three and a half weeks' sulfapyridine and irrigation. The discharge was profuse even under quarter hourly irrigations. Penicillin (1,200 units per cubic centimeter) was dropped into the eye hourly. In twelve hours the pus had much diminished and in two days it had gone; the eyes were open and the conjunctivae white. No gonococci were seen in films made eight days later, after penicillin had been discontinued for forty-eight hours. No recurrence was reported." Sorsby [7] and his co-workers reported that they had cleared the conjunctiva in thirty-six hours with penicillin therapy of gonococcic ophthalmia neonatorum. Griffey [9] successfully treated a man aged 24 suffering from sulfonamide resistant gonorrheal ophthalmia and gonorrheal urethritis of forty-six days' duration. "Therapy consisted of intramuscular injections of 25,000 units of penicillin sodium every three hours for a total of ten injections." Cultures of Neisseria gonorrhoeae were grown from the eyes and the urine. Similar cultures taken after five and one-half hours' treatment were negative for gonococci. Local therapy was confined to atropine as a mydriatic. Final vision was normal bilaterally.

These results contrast favorably with those reported by Sorsby and Hoffa.[12] They treated 60 cases of gonorrheal ophthalmia in children with sulfonamides and reported a clinical cure in three days in 51.7 per cent of the cases and in eight days in 90 per cent of the cases. Sulfapyridine, sulfathiazole, sulfamezathine and sulfadiazine were given internally. These results were unusually good previous to the advent of penicillin therapy.

Penicillin should be given preference also in the treatment of streptococcic and sensitive staphylococcic infections. Some strains of staphylococci are resistant to penicillin. Cross infection is a frequent occurrence. If the new organism is not sensitive to penicillin and assumes virulence, the progress of penicillin therapy will be altered unfavorably. Walker [11] is of the opinion that loss of virulence under treatment by a strain of staphylococci resistant to penicillin is problematic. Several chronic orthopedic cases were treated for three different periods with rest intervals. The bacteria did not become penicillin fast. He encountered one organism that became resistant under treatment.

A case of resistant Staphylococcus aureus infection is reported briefly:

> A soldier with chronic ulcerative blepharitis, subacute conjunctivitis and pyoderma of his face was found to have hemolytic Staphylococcus aureus, coagulase positive, in cultures from lesions of the conjunctivas, eyelids and face. A solution of sodium penicillin, 1,000 Oxford units per cubic centimeter of isotonic solution of sodium chloride, was instilled into both eyes every two hours for thirty days. During this period of treatment the right eye on one occasion and the left eye on two occasions, coincidental with a temporary increase in the facial infection, became acutely red and superficial marginal ulcers of the cornea developed. It was discovered that this strain of staphylococci was resistant to penicillin in concentrations of 10,000 units per cubic centimeter on a seeded nutrient agar plate. The organism was mildly sensitive to sodium sulfathiazole in 3 and 5 per cent solutions in vitro. The strength of the penicillin drops was increased to 10,000 Oxford units. The patient complained of considerable local irritation, and at the end of thirty-six hours withdrawal of the treatment was contemplated. The brand of penicillin was changed, and further treatment was well borne. Penicillin 10,000 units per cubic centimeter was continued every two hours for seven days. At this time conjunctival cultures from the right eye showed nine colonies of hemolytic Staphylococcus aureus, coagulase negative, and from the left eye diphtheroid organisms. Cultures from both eyes were sterile four days later. The blepharitis had disappeared. The lower palpebral conjunctiva was mildly congested. The facial pyoderma, which had not been treated, was quiescent. The patient was referred to a dermatologist for treatment of his skin.

One month previous to treatment of his blepharoconjunctivitis, this patient was treated with penicillin parenterally for a left mastoid infection, from which were cultured a beta hemolytic streptococcus and a nonhemolytic Staphylococcus albus.

The possibility of desensitization of the strain of staphylococci found in the eyelids and conjunctiva by previous penicillin therapy has to be considered, even though staphylococci were not demonstrated in the mastoid. The prolonged exposure of the nonsensitive pathogen to penicillin may have reduced its virulence, but remissions occur in this disease.

The treatment of meningococcic conjunctivitis with sulfonamide compounds, both locally and orally, has been favorably reported by Theodore and Kost.[13] Eight patients with this disease so treated were clinically and bacteriologically cured in not more than

12. Sorsby, A., and Hoffa, Elizabeth L.: The Sulfonamides in Ophthalmia Neonatorum, Brit. M. J. **1**: 353 (March 11) 1944.

13. Theodore, F. H., and Kost, P. F.: Meningococcic Conjunctivitis, Arch. Ophth. **31**: 245 (March) 1944.

five days each. Local application of penicillin could not offer much improvement on this record. Penicillin administered parenterally is not secreted in the tears or cerebrospinal fluid; therefore this method of treatment would not be applicable.

The toxin of diphtheria is not neutralized by penicillin. Diphtheria antitoxin should be administered also in the treatment of diphtheritic conjunctivitis. Penicillin is an auxiliary to other known methods of treatment of gas gangrene. Walker [11] reported gratifying success in several cases of actinomycosis with parenteral administration of penicillin. Mahoney [14] and Bloomfield [15] have reported sensitivity of Treponema pallidium to penicillin. Riba [16] confirmed their results with penicillin parenterally and intrathecally in cases of early syphilis and neurosyphilis. Diphtheroid organisms are seldom virulent. They are susceptible to local penicillin therapy.

ILLUSTRATIVE CASE REFERENCES

Ulcerative Keratitis.—Local and systemic penicillin therapy is indicated in acute, severe ulcerative keratitis in the presence of a sensitive organism. In chronic indolent corneal ulcerations, local penicillin therapy should be given a trial. Penicillin sometimes has a beneficial effect and hastens the termination of prolonged stubborn corneal ulcerations. Two illustrative cases are summarized briefly:

A white soldier aged 21 acquired an ulcerative keratitis of his left eye in March 1943 secondary to unidentified trauma. There was a diffuse central corneal opacity which stained widely

Fig. 1.—Chronic ulcerative blepharitis, subacute conjunctivitis and pyoderma of the face, secondary to coagulase positive hemolytic Staphylococcus aureus. The organism was resistant to penicillin 10,000 units per cubic centimeter in vitro. The photograph was taken at the beginning of treatment.

with fluorescein on April 29, 1943. The eye was red and painful. The corneal ulceration progressed. Photophobia, lacrimation, headache and ocular pain were constant. The corneal epithelium would not regenerate. Conjunctival cultures showed the presence of a gram negative bacillus and a gram positive bacillus, unidentified. Vision was reduced to hand movements. Enucleation of the eye was seriously considered. Instillation of penicillin, 250 units per cubic centimeter, 3 drops in the left eye every fifteen minutes for two hours and thereafter every half hour, was begun on May 25. On June 4 dosage frequency was reduced to every three hours between 7 p. m. and 9 p. m. Penicillin therapy was discontinued on June 19. Twenty-four hours after treatment was instituted there was definite clinical improvement. The ciliary flush had diminished and the crater of the corneal ulcer was smaller. Forty-eight hours after treatment pain had diminished to such an extent that the patient stated he felt more comfortable than he had felt for a long time. The corneal ulcer slowly healed, forming a vascularized interstitial scar. The conjunctival cultures grew many organisms. Staphylococcus albus, gram positive and gram negative bacilli, diphtheroids and spore bearing bacilli were noted. There was still slight staining of the cornea on June 9. On June 16 the left eye was white, the patient was symptom free and the cornea did not stain. Vision of the left eye was ability to count fingers at a distance of 1 foot. A relapse did not occur. It is reasonably certain that this eye was saved by penicillin therapy.

An officer aged 28 suffered a chemical burn of both eyes and eyelids on December 8, 1943. The left eye healed with minimal corneal opacities and vision of 20/30 — 2. The right

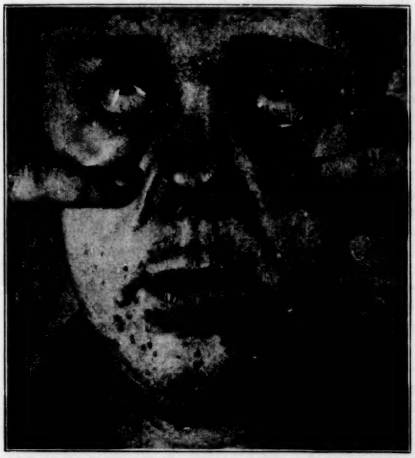

Fig. 2.—Patient illustrated in figure 1 one month after local treatment with penicillin 1,000 units per cubic centimeter. His blepharoconjunctivitis has improved considerably. Staphylococcus aureus is still present. The facial infection was not treated.

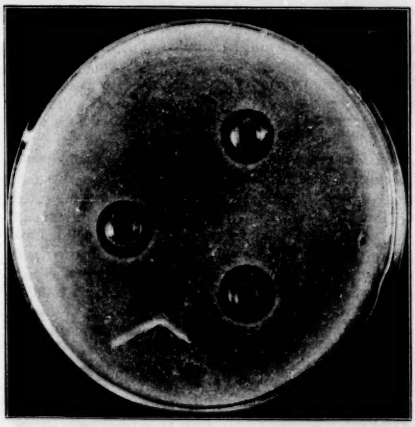

Fig. 3.—Nutrient agar cup plate seeded with Staphylococcus aureus in the same case as figures 1 and 2. The cups contained a solution of penicillin 10,000 units per cubic centimeter. The inhibition rings are minimal. Growth would have been inhibited on most of the plate with a sensitive organism.

cornea remained insensitive, with a low grade superficial ulceration, great photophobia and profuse lacrimation. A hordeolum appeared on the lower left eyelid on Feb. 29, 1944. Conjunctival

14. Mahoney, J. F.; Arnold, R. C., and Harris, A.: Penicillin Treatment of Early Syphilis: A Preliminary Report, Am. J. Pub. Health **33**: 1387 (Dec.) 1943.
15. Bloomfield, A. L.; Rantz, L. A., and Kirby, W. M. M.: The Clinical Use of Penicillin, J. A. M. A. **124**: 627 (March 4) 1944.
16. Riba, L. W.: Personal communication to the author.

cultures revealed the presence of nonhemolytic Staphylococcus aureus, coagulase positive, and nonhemolytic Staphylococcus albus, coagulase negative. Local penicillin therapy was instituted to prevent infection of the cornea. Three drops of sodium penicillin 1,000 units per cubic centimeter was instilled hourly in the right eye. Treatment was discontinued on March 5. The hordeolum was incised and healed rapidly. The cornea did not become infected. Sensation returned to the cornea during penicillin therapy. A small indolent superficial ulcer was still present when penicillin was discontinued. The corneal ulcer did not heal, and symptoms of irritation remained. On March 17 Staphylococcus aureus, coagulase negative, was cultured from the conjunctiva. There was evidence of an acute pharyngitis and cervical adenitis. Local penicillin therapy was resumed every two hours. Atropine mydriasis was maintained. Treatment was discontinued on April 4, at which time the right cornea did not stain. Photophobia and lacrimation had diminished greatly. His right eye was more comfortable than it had been for weeks. Conjunctival cultures were negative. The right cornea stained slightly on two occasions after penicillin was discontinued. Vision was 20/30—2 in each eye on May 13.

This case illustrates the advisability of obtaining and maintaining a sterile conjunctiva in the presence of chronic corneal disease. Penicillin therapy was apparently discontinued too soon in the first instance. No other medication afforded such prompt objective and subjective relief.

Keratitis Dendritica.—Two patients with monocular keratitis dendritica, recurrent in scarred corneas, were treated with penicillin locally and scopolamine mydriasis, without closing the eyes. Penicillin 1,000 units per cubic centimeter every two hours was used in both cases. Cultures in the first case were sterile. At the end of twenty days of treatment there still remained a small staining area on the cornea. A cross infection by a gram negative bacillus resembling the Koch-Weeks or influenza bacillus occurred. The remaining ulceration of the cornea was treated twice by topical application of 95 per cent alcohol, after which final healing was obtained. The second patient was infected with hemolytic Staphylococcus aureus and an unidentified gram negative bacillus. Penicillin therapy was terminated after twenty-three days by a relapse of malarial fever. At this time there remained a small staining area on the cornea. The cornea healed immediately after subsidence of the malarial attack. Conjunctival cultures were sterile after seven days' therapy. This patient has since relapsed. The presence of a nonhemolytic Staphylococcus albus, coagulase negative, was demonstrated. The ulceration progressed under topical applications of alcohol. Penicillin therapy was resumed. A minimal staining area finally healed when the eye was patched. Subjective symptoms were minimal in both patients, although the pupil of the diseased eye was dilated and the eyes were unpatched. No increase occurred in previous corneal scarring. The value of the penicillin therapy was problematic. The element of the curative advantage of hospitalization cannot be overlooked.

Chronic Blepharoconjunctivitis.—Several patients were treated locally with penicillin solution alone and combined with penicillin ointment. A staphylococcus was the chief infective agent in most instances. The majority of these patients responded promptly to treatment. A few relapses occurred. The patients were treated again with penicillin locally, with good results. One instance of complete resistance to penicillin was encountered. It is doubtful that penicillin will cure noninfected allergic conjunctivitis.

Orbital Cellulitis.—Several cases of orbital cellulitis were seen in consultation with the ear, nose and throat section. Early and large doses of penicillin parenterally gave satisfactory results when the causative agent was sensitive to penicillin. Unless orbital cellulitis and cavernous sinus thrombosis are seen early and react favorably to heroic treatment with penicillin, surgical intervention is required also. A more detailed report of this type of disease belongs to the ear, nose and throat practitioner.

Trachoma.—Unsatisfactory results were obtained in 1 case of bilateral trachoma, secondary stage, treated with penicillin 1,000 units per cubic centimeter locally every two hours for nine days. The disease progressed during treatment. Expression of the follicles with Knapp's roller forceps followed by local and systemic sulfonamide therapy brought immediate improvement.

Penetrating Injuries.—The studies of von Sallmann and Meyer [17] suggest the inadequacy of local treatment by instillation of penicillin drops on the cornea and in the lower conjunctival cul-de-sac in the treatment of experimental acute suppurative intraocular infections in rabbits. It is recommended until further clinical and experimental evidence is available that the technic of Cashell [10] and Grant [18] be followed in treating injured eyes. They instilled penicillin directly into the anterior chamber, with favorable results.

Cashell [10] "irrigated" the anterior chamber in 2 cases of perforating injury. The end results were good. A postoperative infected cataract, treated for thirty-three days, was included in this group. In 3 other cases "definite infections of the anterior chamber cleared with penicillin, but chronic cyclitis supervened." These eyes were excised.

Grant [18] reported striking improvement in an eye suffering from exudative iridocyclitis secondary to a penetrating wound and treated with penicillin thirty-four days after injury. Aqueous, 0.25 cc., was withdrawn from the anterior chamber through a hollow needle and replaced by an equal amount of penicillin solution 250 units per cubic centimeter. Forty-eight hours later recovery had begun and marked the turning point in saving the eye. Further penicillin treatment was not required.

Adequate penicillin treatment of an infected perforating eye injury or a metastatic eye infection entails combined parenteral, local and intraocular medication. Continuous intravenous drip of 200,000 Oxford units in twenty-four hours or in less acute cases intramuscular injection of 25,000 units at three hour intervals is recommended. Local therapy may consist of instillation of penicillin 1,000 units per cubic centimeter half-hourly or hourly, supported by the withdrawal of aqueous and replacement by penicillin 1,000 units per cubic centimeter of isotonic solution of sodium chloride. The withdrawal of aqueous when a high level of penicillin in the blood has been obtained should give a maximum secretion of penicillin in the secondary

17. von Sallmann, L., and Meyer, K.: Penetration of Penicillin into the Eye, Arch. Ophth. **31**:1 (Jan.) 1944.
18. Grant, R. B., Jr.: Personal communication to the author.

aqueous, if such secretion occurs. It is doubtful that more than 0.4 cc. of aqueous can be replaced by penicillin. The removal of penicillin from the anterior chamber by natural filtration and dilution by the remaining aqueous and the secondary aqueous would give a primary dilution of not more than 200 units per cubic centimeter of aqueous with further rapid dilution. The effective level of penicillin in the aqueous and the rapidity with which this level is reduced by normal drainage have not been ascertained.

Prophylaxis in Eye Injuries.—The use of penicillin as a prophylactic measure in eye injuries is a justifiable empirical measure. Other therapeusis also should be employed.

An aviator aged 21, who suffered a contusion of his left eyeball, presented an instance of such therapy. The cornea was abraded. There was a hyphema. Vision was reduced to 5/100. Conjunctival cultures revealed hemolytic Staphylococcus albus, coagulase positive. Four days after injury, treatment was started with penicillin 15,000 Oxford units intravenously every three hours and 3 drops of 1,000 units of penicillin per cubic centimeter of isotonic solution of sodium chloride instilled in the left eye half-hourly for eight doses and then hourly. Treatment was continued for six and a half days. The pupil was dilated and a small posterior synechia broken by scopolamine. A diffuse deep interstitial haze developed on the temporal side of the left cornea concurrent with increased hemorrhage in the anterior chamber. The eye culture was negative in one day. On completion of penicillin therapy the corneal haze was reduced to a small linear peripheral scar. The vision in the left eye was 20/20 slowly. The interior of the eye was normal.

This officer presented a therapeutic problem. His training was within one month of completion. There was clinical evidence of severe trauma to his left eye. A pathogenic organism was present in the conjunctival cul-de-sac of his injured eye. This eye manifested a severe inflammatory reaction involving the conjunctiva, episclera, sclera, cornea and iris. There was a choice of therapy between artificial hyperpyrexia and penicillin. Penicillin was chosen because of the presence of a hemolytic Staphylococcus albus, coagulase positive.

Recurrent Post-Traumatic Iritis.—The history of an injured soldier with iritis was enlightening:

A white soldier aged 20 was injured by a dynamite explosion in November 1943. On Feb. 29, 1944 he reported with iritis of his left eye. Examination revealed bilateral corneal scars and traumatic cataracts. There was evidence of previous iritis of his right eye. Sand had perforated his left eye. Conjunctival cultures were sterile. Penicillin was administered intramuscularly, 25,000 units every three hours for four and a half days and reduced to 15,000 units for two days. Mydriasis by atropine was maintained. Recovery was prompt. No sequelae remained. A slightly discharging left amputation stump was not affected by penicillin therapy. On March 20 iritis recurred in his left eye. Treatment of this attack of iritis consisted in keeping the pupil dilated with scopolamine for six days. An aqueous flare, which was present in both attacks, had then disappeared. The blood vessels of the iris were still slightly engorged. Ocular pain disappeared after twenty-four hours of treatment in both attacks of iritis.

This patient exemplified the difficulty of clinical research. It is doubtful that penicillin was of any benefit in this case.

MEDICATION AND DOSAGE

The following routes of administration are applicable in eye diseases:

Local.—Instillation in the eye: Dosage 250 to 10,000 Oxford units dissolved in 1 cc. of isotonic solution of sodium chloride or distilled water, p_H 7.7, administered hourly in acute conditions, every two hours in subacute conditions and not less frequently than every three hours. Cashell [18] reported good local results with less frequent and weaker dosage. He did not report any penicillin fast organisms developing during treatment. Fresh solutions kept in a commercial refrigerator deteriorate very slowly. It has been the practice to replace eye solutions, kept at room temperature, after forty-eight hours. The solutions are still potent in vitro.

Ophthalmic ointment: Dosage 250 to 500 units incorporated in a gram of ointment base. Commercial petrolatum or hydrous wool fat 25 per cent combined with cold cream 75 per cent showed a satisfactory zone of diffusion of penicillin in vitro on seeded plates. Penicillin ointment still showed appreciable penicillin activity after six months in a commercial refrigerator. Diffusion activity lessens appreciably after twenty-five days at room temperature. One specimen was still potent after forty-five days at room temperature.

Intraocular: Aqueous is withdrawn from the anterior chamber through a needle and replaced by penicillin. Local or general anesthesia is employed. Incomplete incision of the cornea at the site of puncture simplifies passage of the needle. Freshly prepared penicillin 500 to 1,000 units per cubic centimeter of isotonic solution of sodium chloride is used. Aqueous to the extent of approximately 0.4 cc. may be withdrawn with impunity. The strength of the injected penicillin is immediately reduced by the remaining aqueous and is soon further reduced by removal by normal filtration and dilution by new aqueous.

Parenteral.—Intramuscular: Dosage from 15,000 to 25,000 units in isotonic solution of sodium chloride or fractionally distilled pyrogen free distilled water injected into the thigh, gluteal or upper back muscles every three hours.

Intravenous: Intravenous solutions are made daily. Pyrogen free isotonic solution of sodium chloride and 5 per cent dextrose are used as solvents. Intermittent dosage 15,000 to 25,000 units injected slowly every three hours. Continuous drip dosage 200,000 units of fresh penicillin dissolved in 2,000 cc. (2 liters) of saline or dextrose solution administered in twenty-four hours at a basic drip rate of approximately 30 drops per minute. Treatment may continue for several days. Larger doses have been given without ill effect. A dextrose solution is recommended in the presence of kidney disease to avoid possible anasarca.

Intrathecal: Riba [16] has found the administration of 25,000 units in 2.5 cc. of isotonic solution of sodium chloride by replacing an equal amount of spinal fluid very satisfactory. The medication is repeated at forty-eight hour intervals or oftener in acute disease. Penicillin accumulates in the spinal fluid.

Staphylococcic infections require three or four times as much penicillin as streptococcic infections. Queen [19] has found the minimum effective blood level for the staphylococcus 0.3 unit per cubic centimeter of circulating blood. A concentration of 0.03 unit per cubic centimeter is sufficient for streptococcic infections. It has been the practice to continue reduced treatment for two or three days after a clinical cure has been obtained.

19. Queen, F. B.: Personal communication to the author.

Penicillin may be discontinued sooner in acute infections than in chronic infections without fear of relapse. Penicillin is thermolabile. A p_H of 7 to 7.7 is recommended for solutions and ointments. Penicillin stock solutions should be refrigerated.

COMPLICATIONS

Most complications, such as phlebitis, pyrexia, pain at the site of injection, vascular and sympathetic disturbances and muscular cramps, have largely disappeared with the use of purer penicillin.

Generalized allergy with urticarial manifestations, with or without fever, has occurred. Thrombophlebitis may occur at the site of prolonged intravenous injection. Local allergy of a mild degree affecting the eyelids and skin below the eyes is easily controlled by covering the eyelids and skin with a neutral waterproof emollient.

An unusually severe allergic reaction was obtained, in 1 instance following instillation of 4 drops of sodium penicillin 1,000 units per cubic centimeter into both eyes at hourly intervals. There was evidence of redness and puffiness of the eyelids before the last drop was administered. The eyelids then became very red, hot and nearly closed by edema. The conjunctiva was acutely congested. The mucous membrane of the nose and throat was red, dry, painful and glossy. A temperature of slightly more than 100 F. was carried for four days. The patient complained of malaise similar to that noted after an inoculation with antityphoid vaccine. He was hospitalized for a week. The penicillin used in this case was tested on another patient and on a rabbit with negative results. A skin patch test elicited a negative reaction. Cutaneous disturbances had been experienced by the patient on ingestion of certain sea foods, chocolate, strawberries and rice.

The complication of cross mixed infection in ocular diseases is not so important as in general infections but may retard recovery. There is evidence suggesting that with the extermination of a virulent penicillin sensitive organism present in a given case the remaining nonsensitive organisms are not very pathogenic.

Local irritation caused by the early batches of penicillin has disappeared with purification of the drug.

Inadequate early treatment with penicillin may cause reduction of sensitivity of the organism treated or even penicillin fastness. In such cases intensive treatment with penicillin may be tried with some prospect of obtaining clinical improvement with lessened virulence of the organism. The combined or alternate use of sulfonamide drugs should be tried.

Fig. 4.—Right eye of patient with bilateral acute conjunctivitis superimposed on a chronic follicular conjunctivitis and associated with a head cold. Alpha hemolytic streptococci and coagulase negative hemolytic Staphylococcus albus were present in both eyes. Conjunctival cultures were sterile after five days' local treatment with penicillin 1,000 units per cubic centimeter. Treatment was continued for eight more days because of turgid palpebral conjunctiva.

The criteria of successful penicillin therapy are speedy relief of a patient's symptoms and rapid subsidence of infection.

COMMENT

Penicillin is the drug of choice in the treatment of ophthalmic diseases secondary to infection with gonococci, streptococci and sensitive staphylococci. Penicillin should be given a trial in the treatment of diseases caused by N. meningitidis, N. catarrhalis and pneumococci. The use of penicillin is optional in the treatment of infections caused by C. diphtheriae, Cl. welchi, Actinomyces bovis and Treponema pallidum.

Fig. 5.—Acute allergy to local penicillin followed bilateral instillation of 4 drops of penicillin 1,000 units per cubic centimeter. Acute edema of the eyelids, congestion of the sclera, conjunctiva and the mucous membrane of the nose and throat with pyrexia and malaise were manifested.

The relief afforded by penicillin when it is effective is usually prompt, in some instances startling and usually better than that afforded by other modes of medication. Considerable penicillin can be saved by identification of the bacteria present in a disease before treatment is instituted. A primary sensitivity test is recommended in chronic infections caused by staphylococci. An unfavorable early response to penicillin therapy suggests a reappraisal of the case. A virulent resistant organism may be present.

In diseases caused by a noninfectious process such as allergy the removal of a secondary infection by penicillin is helpful but obviously leaves the primary problem unsolved.

The use of penicillin as a prophylactic in certain intraocular operations and ocular injuries is recommended. Experience suggests that it is a better practice to give an overdose of penicillin rather than an underdose. It is anticipated that the dosage of penicillin will be stabilized in the near future, but, as with all drugs, the dosage will be subject to modification in acute and resistant diseases.

Early and large doses of penicillin are indicated in orbital cellulitis secondary to infection in the paranasal sinuses and adjacent venous dural sinuses.

Penicillin solutions, because of their instability, do not lend themselves to office and home medication as readily as more stable drugs. Penicillin solution 1,000 units per cubic centimeter of isotonic solution of sodium chloride tested in vitro on a nutrient agar cup plate seeded with Oxford staphylococci produced an inhibition ring 45 mm. in diameter. After twenty-one days at room temperature the diffusion ring was still 40 mm. in diameter. Penicillin ointment is reasonably stable for at least a month at room temperature and for six months in a commercial refrigerator. There is a constant danger of contamination of penicillin by resistant organisms. Heat destroys penicillin; therefore resterilization is not feasible.

It is anticipated that in private practice penicillin will frequently have to be used in an empirical manner. In spite of this handicap it will be found that a valuable and dependable drug has been added to the armamentarium of the ophthalmologist.

THE USE OF PENICILLIN IN DISEASES OF THE EAR

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AND
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Penicillin has been proved to be a very powerful antibacterial agent. Much has been written about its value in the treatment of many severe and previously often fatal infections. Until recently its use was restricted to overwhelming infections which did not respond to other forms of therapy. Lately the increased production of the drug has made enough available to permit its employment in more common infections, such as those of the ear.

Penicillin is a powerful antibacterial substance produced by Penicillium notatum in ordinary nutrient broth.[1] It is highly soluble, relatively unstable and easily destroyed by dilute acids. It is hygroscopic and rapidly loses its activity if exposed to air, but it retains its activity for twenty-four hours if absolutely dry.[2] Penicillin is not affected by pus, blood, serum or the products of breakdown of tissue. The number of organisms has little effect on its bacteriostatic action. Penicillin inhibits the growth of bacteria while the body defenses, humoral and cellular, destroy the organisms.[3] Purified penicillin in dilution of 1:25,000,000 will completely inhibit the growth of Staphylococcus aureus [4] and is free from toxic reactions.

Hobby, Meyer and Chaffee [5] made studies of the susceptibility of various strains of many organisms to penicillin. The susceptible organisms are pneumococci, hemolytic Streptococcus, staphylococci, meningococci, gonococci, Streptococcus viridans, Bacillus subtilis, Clostridium welchi, Clostridium septicum, Clostridium histolyticum, Bacillus sporogenes, Bacillus oedematiens, Bacillus sordelli, lactobacilli and Cryptococcus hominis. Insusceptible strains are Hemophilus influenzae, Escherichia coli, Salmonella paratyphi A, Salmonella enteritidis, Bacillus pyocyaneus, Bacillus fluorescens, Bacillus prodigiosus, Friedländer's bacillus, Staphylococcus albus (1 strain), Micrococcus albus (1 strain), Monilia albicans, Monilia kruzei and Monilia caudida. Gardner [6] has observed morphologic changes in all the rod shaped organisms that showed any inhibition by penicillin. These changes are attributed to a failure of fission; growth proceeds, but division and separation of the cells do not follow in due course.

Salts of penicillin, such as ammonium, sodium and calcium, have been prepared for clinical use. The quantity of the drug used is expressed in terms of the Oxford unit. The latter is defined as that amount of penicillin which, when dissolved in 50 cc. of meat extract broth, just inhibits completely the growth of the test strain of Staphylococcus aureus.[7]

According to Dawson and Hobby,[8] the establishment of correct dosage and frequency of administration are problems of great complexity. They recommend that the sensitivity of the infecting organism be tested whenever possible in cases which do not respond satisfactorily. Penicillin can be administered by continuous subcutaneous infusion, continuous intravenous injection, intramuscular injection, intrathecal injection and local instillation. The advantages and objections to these routes have been discussed by Bloomfield, Rantz and Kirby.[9] The more severe infections are treated by continuous intravenous injection, because a higher concentration of penicillin in the blood can be obtained. When the drug is injected intramuscularly, the blood level is lower but is more evenly sustained. If a single intravenous injection of penicillin is given, about two thirds of it will be recovered promptly in the urine.[10] In his discussion in a symposium on "Antibiotic Agents," Keefer [11] reported that there was no universal agreement on dosage, best method of administration or duration of treatment, stating that the final answer

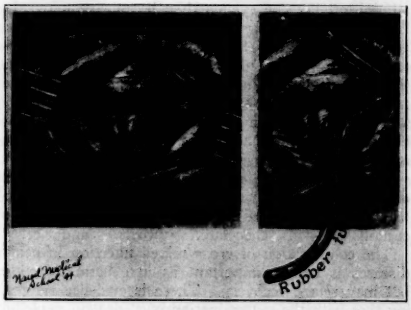

Fig. 1 (case 2).—*A*, mastoid cavity at completion of simple mastoidectomy; *B*, insertion of the rubber tube.

to these questions will come only from the study of more cases.

The Penicillin Committee at the National Naval Medical Center believes that the intramuscular administration of the drug is the most practicable. In order to ensure the therapeutic effectiveness of the drug, this committee stresses the importance of two conditions: (1) the maintenance of adequate nutrition and a positive nitrogen balance in patients receiving the drug and (2) accurate preliminary bacteriologic studies to determine that the pathogen is an organism susceptible to the drug.

Infectious diseases of the ear can be effectively treated with penicillin because the anatomic structure of the ear permits the local administration of the drug and because the organisms causing most acute infections of the ear are usually in the group considered to be susceptible to the drug. Fowler [12] made a study of 452

The illustrations are the work of Lieut. L. Schlossberg, H-(V)S, U. S. N. R.

This study was supervised by the Penicillin Committee of the National Naval Medical Center, Bethesda, Md.

Read in a symposium on "The Use of Penicillin in the Treatment of Diseases of the Eye, Ear, Nose and Throat" before the joint meeting of the Section on Ophthalmology and the Section on Laryngology, Otology and Rhinology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

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consecutive cases of acute otitis media. If his statistical analysis of the causative organisms in that series is considered representative of their relative incidence, then 90 per cent of the organisms are susceptible to penicillin.

Fig. 2 (case 2).—Closure of wound for rubber tube.

In this study the sodium salt was used. It was given either by continuous intravenous injection, intramuscular injection or local instillation. In 1 instance a combination of the intramuscular and local routes was used.

Fig. 3 (case 2).—*A*, wound covered with gauze impregnated with penicillin ointment and injection of penicillin solution into mastoid cavity; *B*, rubber tube sealed after injection of penicillin; *C*, tube protruding through dressing in order to facilitate aspiration of exudate and instillation of penicillin.

METHOD AND RESULTS

1. *Acute Otitis Media.*—In acute otitis media, penicillin is administered by intramuscular injection. The amount of drug necessary to combat the infection will vary according to its causative organism and severity. Staphylococcic infections, as a rule, require a greater amount of penicillin than those due to streptococci. The drug should be continued after the patient has appeared to recover to avoid possible relapse.

CASE 1.—G. E. G., a white youth aged 18, was admitted to the hospital with the history of a sense of fulness in his left ear of one week's duration. His temperature was 100 F. Blood examination revealed red blood cells 4,700,000, white blood cells 12,450, hemoglobin content 13.5 Gm.

Examination showed severe congestion of the mucosa of both nasal chambers. The sinuses were clear. The left ear drum was red and thickened, and there was a pulsating discharge from a posterior inferior perforation. Cultures showed the organism to be a hemolytic streptococcus. He was given sulfadiazine 4 Gm. initially and then 1 Gm. every four hours. His left ear continued to discharge, and eleven days later his temperature, which had been normal, began to fluctuate between 99 and 101 F. The sulfadiazine level at this time was 11 mg. per hundred cubic centimeters of blood.

X-ray examination of the mastoids revealed the right mastoid to be well developed, well aerated and apparently clear. The left mastoid showed a less degree of development than the

Fig. 4 (case 2).—Wound at the end of seven days, showing clear sterile exudate being expressed from the rubber tube prior to its removal.

right, and there was rather poor aeration of the cells. In the squamous portion of the left mastoid there was what seemed to be destruction of trabeculae between the air cells, and many of these cells appeared to be filled with material of soft tissue density. The impression was destructive mastoiditis, left.

Sixteen days after onset of infection, at the time when it appeared that a mastoidectomy would be necessary, penicillin was administered. Sulfadiazine was discontinued, and the patient was given 20,000 units of penicillin intramuscularly every three hours day and night for a period of two weeks.

His temperature became normal twenty-four hours after the start of penicillin and the ear became dry on the seventh day of penicillin therapy, which extended over a two week period in all. At the end of this time his left ear drum returned to normal and the patient was discharged from the hospital. He received a total of 2,260,000 units of penicillin.

It would appear that penicillin was effective in sparing this patient an operation.

Fourteen additional cases of acute otitis media were successfully treated with penicillin. The pathogens obtained on culture from these patients are listed in the table. The penicillin was given by intramuscular injection. The amount of the drug required varied from

360,000 to 1,140,000 units per patient over a period varying from five to fourteen days.

2. *Acute Mastoiditis.*—When surgical intervention is done for acute mastoiditis it can be supplemented by penicillin administered either by intramuscular injection or by local instillation into the mastoid cavity. The Floreys [3] employed the latter method by means of controlled drainage in 22 cases of surgical mastoiditis. They inserted a rubber tube into the mastoid cavity and closed the incision completely except to accommodate the tube. Penicillin was then instilled into the cavity through the tube, which was then sealed off. Afterward every six hours the exudate was aspirated from the cavity and fresh penicillin was instilled through the tube, which was again sealed. Free drainage was not allowed at any time. This routine was employed for a period of five days, and an average of 17,300 units per case was required. The ear usually became dry within a period of five days, and primary healing resulted in 19 of the 22 patients. The second and third patients received the drug both intramuscularly and locally after the method of Florey with slight modification, the other only locally:

CASE 2.—S. B. H., a white woman aged 25, was admitted to the hospital with the history of having had a discharging right ear for three weeks. She had received a total of 17 Gm. of sulfadiazine and 50 Gm. of sulfanilamide before entering the hospital. In the preceding week she had complained of noc-

Organisms in Fifteen Cases of Acute Otitis Media

Organism	No. of Cases
Staphylococcus aureus	2
Hemolytic Staphylococcus aureus	2
Hemolytic streptococcus	8
Pneumococcus type 1	1
Hemolytic Staphylococcus aureus and hemolytic streptococcus	2

turnal pain over the right mastoid and general malaise. Examination was negative except for the ear. There was a thick purulent discharge in the right canal. The ear drum showed a posterior perforation, and the mucosa of the middle ear was red and thickened. Pain was elicited on pressure over the mastoid.

X-ray examination of the mastoids disclosed that on the left side the mastoid cells were well aerated. On the right side the cells in the temporal portion of the mastoid were indistinct and the bony separations of the mastoid cells were poorly outlined and most of the cells appeared blurred. There seemed to have been definite bony destruction of the trabeculae separating some of the cells in this area.

The patient's temperature was normal on admission but fluctuated between normal and 99.2 F. for the first few days. The sedimentation rate showed a fall of 31 mm. at the end of an hour. Blood examination revealed red blood cells 3,000,000, hemoglobin content 10 Gm. and white blood cells 8,300. The urinalysis was negative.

She had lost 6 pounds (2.7 Kg.) in three weeks and felt generally below par. Soon after admission she was given 30,000 units of penicillin intramuscularly every three hours. Three days after admission she was given a transfusion of 250 cc. of whole blood. The following day a simple mastoidectomy of the right ear was performed. Operation revealed free pus, considerable breaking down of the mastoid cells in the region of the tip and over the lateral sinus, pathologic exposure of the sinus and thickening of its wall. A hemolytic streptococcus was cultured from the pus.

At the completion of the operation a small rubber tube of 14 French caliber was inserted into the wound, one end being left in contact with the antrum and the other end protruding through the incision to a length which permitted its opening to lie outside the dressings. The incision was closed tightly except for the rubber tube passage. Fifteen cc. of a solution containing 1,000 units of penicillin per cubic centimeter was injected through the rubber tube into the mastoid cavity, and the external canal was packed tightly with gauze impregnated with penicillin.

Thereafter, every six hours during a period of forty-eight hours, the wound was aspirated and 3 cc. of the penicillin solution was injected into the mastoid cavity via the rubber tube (for illustration of technic see figures 1 through 4). During the same period the patient received 30,000 units of penicillin intramuscularly every three hours. On the third day the instillation of penicillin into the mastoid cavity was discontinued but the rubber tube remained completely sealed off, so that there was no drainage at any time. Also on the third day the intramuscular injections of penicillin were reduced to 15,000 units every three hours. On the seventh postoperative day the intramuscular injections were discontinued and the rubber tube was removed from the mastoid cavity. On the eighth postoperative day the incision was healed, the middle ear was dry and the perforation of the ear drum had healed. The patient had no further trouble with her ear. During the course of her disease she received a total of 1,905,000 units of penicillin intramuscularly and locally. Penicillin caused no noticeable untoward reaction and appeared to have shortened her convalescence greatly.

CASE 3.—C. J. S., a white man aged 25, was admitted to the hospital with acute appendicitis. An appendectomy was performed, and six days after operation he complained of a sore throat. On the seventh day he had severe pain and a serous discharge from his right ear. He was transfered to the eye, ear, nose and throat service the same day, with the diagnosis of acute otitis media, right ear. He was given sulfadiazine 4 Gm. initially and 1 Gm. every four hours afterward day and night. Cultures of the exudate from the right ear showed the presence of a hemolytic streptococcus. His right ear continued to discharge, and on the tenth day of the ear infection he had considerable pain over the right mastoid process and right facial paralysis. There was x-ray evidence of a right mastoiditis. The sulfadiazine level at this time was 6 mg. He was given a blood transfusion of 250 cc., and a simple mastoidectomy was immediately performed. Operation revealed pus under pressure in the mastoid cells bordering on the digastric groove, with no breaking down of the cells. At the completion of the operation a rubber tube was inserted into the wound, so that one end came in contact with the antrum and the other end protruded through the incision. The wound was closed except for the rubber tube passage. For eight days after operation once a day 3 cc. of a solution containing 250 units of penicillin per cubic centimeter was instilled into the mastoid cavity through the rubber tube and sealed in. On the ninth postoperative day the rubber tube was removed. On the tenth day the facial paralysis began to disappear, and after two weeks the patient had almost complete restoration of motion in the right side of his face. After the operation there was no purulent drainage at any time from the mastoid wound. A total of 6,750 units of penicillin was used.

In this case penicillin appeared to shorten convalescence and hasten recovery from facial paralysis.

3. *Acute Labyrinthitis.*—Penicillin can be administered by continuous intravenous injection for the treatment of acute labyrinthitis. In the following case treatment was successful by this means.

CASE 4.—L. C. P., a white man aged 33, a physician, was admitted to the hospital on Sept. 10, 1943 with the history of having had vertigo, tinnitus and deafness of his left ear for one month and severe pain in his left ear for one week. In September 1942 he had had an osteomyelitis of his twelfth dorsal vertebra caused by hemolytic Staphylococcus aureus and successfully treated by operation and a sulfonamide drug. In March 1943 he had had empyema of the gallbladder caused by the same organism and successfully treated by surgery and a sulfonamide drug. In May 1943 he had had what appeared

to be an attack of Ménière's syndrome on the left side without any subsequent complaints until his present illness.

On admission his temperature was 99.4 F. He had nystagmus to the right on right lateral gaze and slight nystagmus to the right on upward gaze. There was no evidence of active disease in the nose and throat. His right ear was normal; his left ear drum was injected. The left ear was totally deaf. Blood examination revealed red blood cells 4,720,000, hemoglobin content 13 Gm., white blood cells 7,750. Blood culture and urinalysis were negative. During the first twenty-four hours his temperature fluctuated between normal and 99.4 F. by mouth. He complained of severe pain deep in the left side of his head, which could be controlled only by large doses of morphine. The neurologic examination was negative except for the labyrinthine disturbances. X-rays of the skull and mastoids showed no evidence of disease.

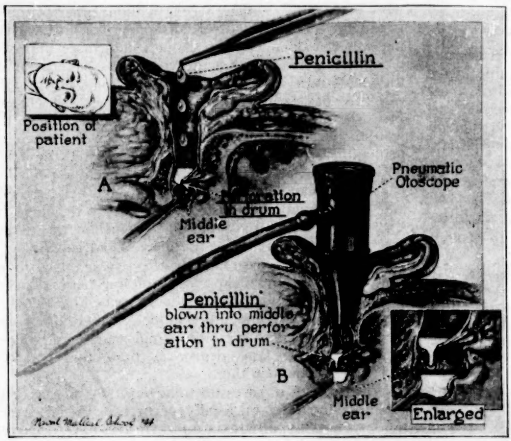

Fig. 5 (case 5).—*A*, instillation of penicillin into the external canal; *B* and *C*, use of pneumatic otoscope in chronic otitis media.

It was the opinion of the neurologic service that the patient had an osteomyelitis of the left petrous pyramid, with involvement of the labyrinth, and that the infection was probably metastatic in origin.

The pain in his left ear became progressively worse and on his sixth hospital day a left myringotomy was performed with nitrous oxide-oxygen anesthesia. Clear fluid was obtained from the left middle ear. Cultures showed the organism to be hemolytic Staphylococcus aureus. In view of the history of previous severe infections with the same organism and the possibility that the middle ear disease might be secondary to cranial osteomyelitis, it was decided to give the patient penicillin. After the myringotomy, penicillin was begun by continuous intravenous injection and continued for five days. He got a total of 455,000 units. It is noteworthy that the patient was free from pain twenty-four hours after penicillin was begun and that his temperature returned to normal in forty-eight hours. His left ear was dry on the fifth day, and his ear drum gradually returned to normal. Subsequent studies confirmed the total loss of hearing in his left ear and revealed a total loss of vestibular response to left caloric stimulation.

Apparently this patient had an acute labyrinthitis on the left side, with the exudate working its way through into the middle ear. Its metastatic origin is supported by the identity of its causative organism with that of two previous infections, one of which was certainly hematogenous. He has been left with complete loss of cochlear and vestibular function on the left side. There has been no recurrence of tinnitus or vertigo.

4. *Chronic Otitis Media.*—In special instances chronic otitis media can be treated successfully by the local instillation of penicillin into the middle ear. The patient who has a chronic discharging ear caused by an organism susceptible to the drug and has a large perforation of the ear drum with no evidence of granulations or cholesteatoma is best suited for penicillin therapy. The pneumatic otoscope can be used to force the drug into the middle ear,[13] and the penicillin can be sealed into the ear by means of cotton impregnated with a bland ointment (see figures 5 and 6 for illustration of technic).

CASE 5.—H. F. J., a white man aged 32, was referred to the outpatient department for treatment of a right chronic otitis media. For several years he had had continuous discharge from his right ear varying in amount. Examination showed a moderately thick tenacious discharge in the right external canal and a large anterior inferior perforation of the right ear drum; there was no granulation tissue. X-ray study showed evidence of a chronic mastoiditis on the right side. There was no evidence of a cholesteatoma. Over a period of years the patient had received different kinds of treatment, including boric acid and alcohol drops, Sulzberger powder and sulfonamide powder. Cultures showed the presence of a Staphylococcus aureus.

He was treated in the outpatient department. A few drops of a solution containing 250 units of penicillin per cubic centimeter were instilled into the right ear while the patient's head was inclined to the left. The penicillin was forced into the middle ear through the perforation by means of a pneumatic otoscope. The canal was then filled with the penicillin solution, and the drug was trapped in the ear by means of cotton impregnated with a bland ointment. The patient was given a small bottle of the solution to take home and was told to remove the cotton and to dry the canal after six hours. He was instructed to lie on the left side before going to bed and to instil a half medicine dropper of the penicillin solution into his right external canal and to trap the solution with cotton impregnated with ointment, placed at the external meatus. This routine was carried out for a period of

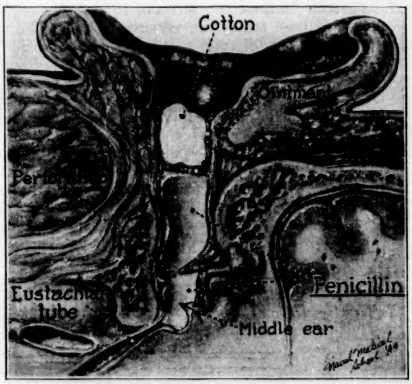

Fig. 6 (case 5).—Penicillin sealed in external canal and middle ear by cotton impregnated with ointment.

13. Canon, R. T.: Personal communication to the authors.

eight days. His ear became dry and has remained dry for a period of six months. A total of 10,000 units of penicillin was used. The drug had no effect on the perforation.

One other case of chronic otitis media due to Staphylococcus aureus was successfully treated by the same method, but several other cases did not respond satisfactorily.

SUMMARY

A study was made of the use of penicillin in diseases of the ear. The drug was found to be of value in the treatment of acute otitis media, acute mastoiditis, acute labyrinthitis and chronic otitis media. A technic was developed for the use of penicillin by local instillation into the external canal and middle ear as well as into the postoperative mastoid cavity.

Penicillin has been employed with substantial benefit in many instances in which other forms of therapy had failed. It was possible either to avoid surgical intervention for acute mastoiditis or to use the drug as a supplement to surgery with significant help.

When the drug is instilled into the mastoid cavity after operation, healing is prompt and the period of convalescence is shortened. Penicillin is the most powerful chemotherapeutic agent available to combat acute otitis media, acute mastoiditis and their complications.

USES OF PENICILLIN IN DISEASES OF THE NOSE AND THROAT

CAPTAIN F. J. PUTNEY
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Penicillin must not be used indiscriminately, but its effectiveness in combating susceptible infections is benefiting practically every branch of medicine. We have employed it at Bushnell General Hospital since April 1943 chiefly in overwhelming infections and complications of ear, nose and throat diseases when life was endangered. In the entire series of 19 cases the organisms were those which are sensitive to penicillin, in general the group of cocci. This presentation will be limited to the 9 cases classified as instances of sinus complications.

Originally penicillin was administered intravenously, either by repeated venous punctures every two hours or by continuous drip, but both of these methods have largely been supplanted by the intramuscular route. Continuous drip injection may be preferable for extremely ill persons with grave infections when a high prolonged blood concentration is desired. After the hazardous phase has subsided, intramuscular use may be substituted. In general, the dosage we have employed was 25,000 units intramuscularly every three hours, which was reduced to 15,000 units as the patient improved, the three hour period being maintained. Penicillin used locally is also bacteriostatic, but we have not depended on local use alone and have usually combined local with systemic administration. The organisms in all except 1 of this group of cases remained sensitive to the drug. In 1 case the organism became penicillin fast after several weeks of treatment. When there has been no improvement in the appearance of a wound and continuation of purulent drainage after three or four days of penicillin therapy, one should suspect that the organism is resistant to the drug and sensitivity tests are indicated. In our experience failure to respond to penicillin has been due to a resistant bacterial strain.

In the early stages of using this drug while endeavoring to determine its range of usefulness, large doses were employed for many weeks without other forms of treatment. The results were disappointing in that healing was not obtained even though immediate improvement was noted. The acute conditions have afforded the most gratifying results, while in chronic diseases the response has been hard to evaluate. In the chronic cases the infections could be controlled and most of the wounds sterilized while the patients were receiving penicillin, but after treatment was terminated the infection again became active. In osteomyelitis penicillin has not supplanted surgical procedures but helps materially in combating the disease. Adequate drainage by surgical intervention in addition to penicillin was necessary to effect a cure in the majority of our cases.

Penicillin has proved equally effective against sulfonamide resistant organisms. All of our patients were given only penicillin, and none were treated by a combination of this drug and sulfonamides. Patients who had failed to respond to the sulfonamides improved under penicillin to the same degree as those that had not received sulfonamide therapy.

In this series of cases no toxic reactions to the drug either systemically or locally occurred. A few reactions such as hyperpyrexia and urticaria have occurred at our hospital, but except in a rare instance these have not constituted an indication for discontinuing treatment.

Penicillin was employed in the care of 7 cases of osteomyelitis, 5 involving the frontal bone, 1 the frontal and maxillary bones and 1 the superior maxilla. Three cases of orbital cellulitis secondary to sinusitis, 1 with osteomyelitis in addition, have also been treated.

In osteomyelitic infections granulations have been made healthy and draining purulent wounds have become sterile while the patients were receiving penicillin. It is now my feeling that the optimum time for operative measures in acute spreading osteomyelitis is during the period in which the infection has been checked by penicillin. However, it may well be that in certain acute cases if treated early and adequately the disease process may be stopped and healing will take place without radical surgical procedures. In the cases which continue to show progressive bone destruction after adequate therapy, surgical intervention may be accomplished with little risk after the wound has become dry and the cultures have become negative with healing of the surrounding cellulitis. It may require anywhere from one to two weeks of penicillin therapy to attain this state.

In chronic osteomyelitis of the frontal bone it is possible to obtain healing under penicillin therapy without resorting to extensive surgery, and a thorough trial of penicillin lasting over several months may be necessary. When there is no regression under this form of treatment it is my feeling that the involved sinus should be operated on and that this procedure in addition to penicillin therapy may prevent further extensive operations. The occurrence of exacerbations and failure of the disease to heal on discontinuing the drug may require removal of the entire frontal bone. Adequate, repeated and lengthy courses of penicillin treatment are believed to prevent this final step in some cases that might otherwise need radical intervention.

From the Ear, Nose and Throat Unit of the Surgical Service, Bushnell General Hospital, Brigham City, Utah.

Read in a symposium on "The Use of Penicillin in the Treatment of Diseases of the Eye, Ear, Nose and Throat" before the joint meeting of the Section on Ophthalmology and the Section on Laryngology, Otology and Rhinology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

One word of caution should be presented regarding the roentgen examinations, for these findings may indicate improvement and healing while treatment is being given yet at operation extensive necrosis has been found.

Brain abscess, extradural abscess and orbital cellulitis occurred as complications in 3 cases of osteomyelitis without apparent bearing on the response to the drug. The abscess of the frontal lobe of the brain was treated by the method outlined by King modified to the extent that a catheter was inserted into the cavity and local irrigations with penicillin carried out. The extradural abscess presented no particular problem, for the patient had been receiving adequate doses of penicillin and at operation the pus contained no organisms.

The longest period of treatment was that of the patient with osteomyelitis of the superior maxilla and frontal bones. He received 7,375,000 units of the drug over a period of sixty-six days. At the end of this time radical removal of the frontal bone was done because of the failure of penicillin to eradicate the infection permanently.

Our experience with other nose and throat diseases has been limited to a few cases of suppurative sinusitis treated both locally and systemically and several cases of peritonsillar and lateral pharyngeal abscesses in which the drug was given intramuscularly. The infections of the pharynx usually recovered without incision, but I do not recommend this method and I believe that healing would have followed more rapidly if drainage had been instituted. In a case of chronic purulent infection of the maxillary sinuses, cultures became sterile but the discharge continued and at operation the membrane was thickened with chronic inflammatory changes present. Acute infections of the maxillary sinuses have been cured after several irrigations with penicillin, even when the organism was a staphylococcus that had proved resistant to other forms of treatment. The strength of the solution employed locally was 250 units per cubic centimeter. Preliminary investigation of Vincent's infection of the mouth and tonsils indicates rapid healing, with disappearance of organisms after a few days of systemic penicillin therapy.

Complications of Paranasal Sinusitis Treated with Penicillin

Case	Complication	Organism	Treatment	Result
1	Osteomyelitis of maxilla	Strep. (nonhemolytic)	Incision and drainage; penicillin (general)	Recovery
2	Osteomyelitis of maxilla and frontal bone	Staph. aureus (hemolytic)	Penicillin (local and general); surgery	Recovery
3	Osteomyelitis of frontal bone; brain abscess	Staph. aureus (hemolytic)	Penicillin (local and general); surgery	Recovery
4	Osteomyelitis of frontal bone	Staph. aureus (nonhemolytic); Strep. (nonhemolytic)	Penicillin (general)	Unchanged
5	Osteomyelitis of frontal bone; orbital cellulitis	Staph. aureus (hemolytic)	Penicillin (general); surgery	Recovery
6	Osteomyelitis of frontal bone; epidural abscess	Strep. (nonhemolytic); Staph. albus (hemolytic)	Penicillin (local and general); surgery	Recovery
7	Orbital cellulitis	No culture	Penicillin (general)	Recovery
8	Osteomyelitis of frontal bone	No growth	Penicillin (local and general); surgery	Recovery
9	Orbital cellulitis	Strep. (hemolytic); Strep. (nonhemolytic); Staph. aureus	Penicillin (general); surgery	Recovery

Prompt and complete healing was obtained in 3 cases of orbital cellulitis with vanishing of pain within the first twelve hours of treatment. After the first day orbital edema, fixation and proptosis began to decrease, but the underlying disease in the sinuses remained unaffected and in 2 of the cases sinus surgery was essential. In the other case, during the early acute stage of cellulitis, before pus formation, incision and drainage were not necessary, the infection resolving under treatment. All of these patients had previously received sulfonamide therapy with little improvement.

One case of cavernous sinus thrombosis secondary to lateral sinus thrombosis and hemolytic streptococcus bacteremia was treated with the drug. Death occurred on the eleventh day of therapy, even though the initial response to penicillin was satisfactory and there was considerable improvement for a week. Daily blood cultures were positive only before penicillin was started and on the sixth day of therapy. In the first two days 400,000 units of penicillin was given by continuous intravenous drip, followed by 25,000 units intramuscularly every three hours thereafter. During the eleven days of treatment she received 2,335,000 units of the drug. At autopsy both lateral sinuses as well as both cavernous sinuses were thrombosed with an abscess of the cerebellopontine angle; so it is questionable whether surgical drainage would have altered the outcome.

I feel that at the present time penicillin in combination with adequate surgical treatment offers the most effective means of combating some of the serious and life endangering complications encountered in otolaryngology.

ABSTRACT OF DISCUSSION

ON PAPERS OF LIEUTENANT COLONEL KEYES, OF CAPTAIN SWANSON AND LIEUTENANT BAKER AND OF CAPTAIN PUTNEY

MAJOR ELMER A. VORISEK, M. C., A. U. S.: In the hands of my associates and myself penicillin has been used in a dilution of 500 units per cubic centimeter. In cases of gonorrheal ophthalmia it was instilled locally, four drops every hour with negative conjunctival smears and cultures after twenty-four hours, with no recurrences. Intramuscular injections were not given until after the ophthalmic infection was considered cured, except in 1 case in which the genital gonorrhea was cured with intramuscular injections, followed two days later by gonorrheal conjunctivitis in a previously enucleated eye socket. The smears and cultures were negative after twenty-four hours of hourly instillations. In our first case, in spite of rapid recovery within twenty-four hours, we continued instillations at three hour intervals for several days, and the patient developed a typical severe local allergic reaction. This reaction subsided quickly when instillations were discontinued. Even though negative smears and cultures of conjunctival scrapings may be obtained within twenty-four hours, the penicillin solution should be continued, but at less frequent intervals, until three such consecu-

tive daily examinations are reported as negative. We have also used penicillin to irrigate the lacrimal passages in cases of chronic suppurative dacryocystitis, 2 cc. of the 500 unit solution being used daily. After the second irrigation the secretion became almost negligible, and after several days only clear, amber colored, watery fluid was expressed on pressure over the sac. This led us to institute similar daily irrigations beginning within twenty-four hours after dacryocystorhinostomy, with excellent results. Several cases of orbital cellulitis with proptosis have been seen in conjunction with the otolaryngologist, but in each instance penicillin was used intramuscularly, and in 1 case the abscess also was irrigated with the penicillin. Not only did the cellulitis respond rapidly, but the purulent nasal discharge from all the sinuses promptly cleared up within forty-eight to seventy-two hours. In 1 case the low grade chronic sinusitis recurred. My associate has also been particularly enthusiastic in cases of osteomyelitis of the frontal bone secondary to suppurative, frontal sinus disease. There is every indication that, although intramuscular injections of penicillin were distinctly beneficial and were always used, the response, after periodic irrigations with penicillin, was immediate. However, it was found that even penicillin could not replace adequate surgical intervention and proper drainage. In 1 case, in which operation was performed before the advent of penicillin, the persistent drainage ceased immediately after local and intramuscular injection.

MAJOR WALTER J. AAGESEN, M. C., A. U. S.: It is our practice to give 25,000 units of penicillin intramuscularly every three hours day and night for twelve to fourteen days. Especially is this true when the offending organism is the staphylococcus. Captain Plough, in our department of bacteriology, has demonstrated that the sensitivity of different strains of staphylococcus to the action of penicillin varies considerably. He showed that the plasma level of patients receiving 25,000 units of penicillin every three hours intramuscularly does not reach a level of 1 unit per cubic centimeter, which is definitely below the concentration required to kill certain strains of Staphylococcus aureus. After testing twenty strains of Staphylococcus aureus for susceptibility to the drug, he has shown that the most sensitive strain was killed in a plasma concentration of 0.02 unit per cubic centimeter, while the more resistant organisms were not killed in a concentration of 2 units per cubic centimeter. Although at the end of three hours penicillin was readily recoverable in the urine, plasma studies have shown that after 25,000 units intramuscularly the usual plasma concentration during the first hour goes no higher than 1 unit per cubic centimeter. It drops rapidly during the second hour and is not recoverable in the third hour. There is still some doubt as to whether we are really able to shorten the convalescence of the average uncomplicated case of acute surgical mastoiditis appreciably. In chronic mastoiditis, and especially in the acute case with complications (such as meningitis, septicemia or Bezold's abscess), I feel that the convalescence is definitely shortened by the use of penicillin. It will not eliminate pus when there is inadequate drainage, and surgery is still of primary importance. We have found the drug to be effective in acute otitis media. Penicillin has produced a most gratifying response in chronic otitis. Three of our cases of long standing—from eighteen to twenty-five years—dried up completely, without healing of the perforation, in a period of from twelve to fourteen days, with a total of 2,000,000 units of intramuscular penicillin. It is still too early to state definitely that these cases will continue to remain dry. We have found that penicillin is of no value in chronic otitis media complicated by cholesteatoma or aural polyposis, except in 2 cases in which these conditions had been eradicated by surgery. Especially did we find this true when there was infection of the bone. The intravenous route, with its more even concentration, should be used until the infection has been brought under control, following which the intramuscular route can be substituted with maximum therapeutic effect. In bone infections, even though large doses were maintained in the acute cases, the results were disappointing as far as complete healing is concerned without the use of surgery.

COMMANDER E. E. KOEBBE (MC), U.S.N.R.: My associates and I have treated several hundred cases of early acute otitis media with penicillin, and the results have been universally good. We use 15,000 units every three hours around the clock for about seven days or until the drum has resolved and the landmarks return. Then we reduce it to 10,000 and keep that up three or four days, then 5,000 for three or four days. We have treated 22 cases of meningitis complicating otitic infection. As soon as the diagnosis is established by lumbar puncture and by neurologic findings, we give 15,000 units intrathecally. We do not repeat that oftener than twenty-four hours. In most of the cases we give it intrathecally for two or three days until the patient becomes conscious or until the meningitis is under control. Supplementing the intrathecal treatment we give intramuscularly 15,000 units every three hours. We have given 20,000 or 25,000, but in most cases 15,000 units is adequate. The treatment in several instances cleared up the otitis media, so that no surgery was done on the mastoid. In most of the cases of suppurative mastoiditis the laboratory reported a sterile culture when treatment with penicillin was administered for three or four days. With penicillin, at first supplemented by the sulfonamides, recovery occurred in all otitic meningitis cases. Encephalitis cases respond well to intramuscular injections. We have treated 15 cases of lateral sinus thrombosis. In all there was a positive blood culture or occlusion of the lateral sinus demonstrated by operation or both. We give penicillin only intramuscularly at least twenty-four hours before operation, and in many cases the culture from the thrombosed sinus is sterile at operation and we have had no positive blood cultures on any one treated with penicillin for twenty-four hours. Penicillin alone is inadequate in treating lateral sinus thrombosis. An operation is necessary, but in no case have we ligated the jugular vein. We have had septic emboli occur before operation but none after operation.

CAPTAIN ROBERT HENNER, Barksdale Field, La.: I should like to call attention to the work of Schall in the use of heparin in venous thrombosis and tell of an instance of its combined use with penicillin in the case of cavernous sinus thrombosis. This patient was treated with sulfadiazine for about seventy-two hours and under this therapy became moribund and comatose and had a temperature of over 105 F. Institution of intravenous penicillin with the combined use of heparin in an intravenous solution caused the patient to develop rapidly a negative blood culture for the Staphylococcus aureus that was previously present, and in a period of over six weeks of recovery he was returned to full duty. We felt that penicillin offered the cure of disease only because the heparin was used in combination to provide local availability for the control of the infection.

CAPTAIN F. J. PUTNEY, M. C., A. U. S.: I should like to confirm the observation that lateral sinus thrombosis must be operated on as well as treated with penicillin. My associates and I have treated 8 cases of sinus thrombosis, and in every one the sinus was opened, but in a goodly number we were unable to remove the thrombus in the lower end of the sinus at the jugular bulb, and likewise in these cases we did not ligate the jugular vein. We gave adequate doses of penicillin, and, fortunately, did not secure any septic thrombi. Uneventful recoveries occurred.

CAPTAIN C. A. SWANSON (MC), U.S.N.: At the National Naval Medical Center, Bethesda, Md., the Penicillin Committee has now allowed us to use penicillin initially in acute otitis media in place of the sulfonamides. This should give us even better results. It was our experience in prepenicillin days that it takes mastoid wounds at least three weeks to heal. We have had only 3 cases in which penicillin was used locally in the mastoid wound and all 3 cases were healed in eight days. The Floreys in England are the investigators that first advocated the method I have described of controlled drainage. Their surgeon reported 19 out of 22 cases of primary healing in mastoid wounds.

LIEUTENANT COLONEL JOHN E. L. KEYES, M. C., A. U. S.: Those of us in the armed services have had opportunities to study penicillin that were not available to our colleagues at home; therefore it seems only proper and right that we should pass on to them at this stage, when penicillin is becoming available to them, the result of our studies so that they may now join us in further study of the usefulness and limitations of this drug.

SULFONAMIDE THERAPY OF GONORRHEA

RESULTS IN 555 WOMEN MAINTAINED AT A VENEREAL DISEASE TREATMENT CENTER

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Although the number of gonococcic infections in women which have been treated with sulfonamides may run into the millions, there are few reports of results in groups of patients under good enough behavior and treatment control to make them a reasonable substitute for the laboratory animal whose lack has impeded study of this infection. The present material is therefore an example of what can be achieved in a group of women, domiciled throughout in an institution where therapeutic efforts are directed toward improving their clinical condition and enabling them to pass bacteriologic tests of cure as early as possible, and where no patient is released as presumably cured until she can pass such tests. It is derived from the case records of 555 women, 200 Negro and 355 white, who were treated for culture positive gonorrhea at the U. S. Public Health Service Medical Center, Hot Springs, Ark., from December 1942 to April 1944. The mean age of this group is about 20, but a large number are still in their teens. Many types are represented, ranging from young school girls to professional prostitutes. Some are drawn from a wide area, although the greater part come from Arkansas and the adjoining states. The notably high incidence of a precarious family background is reflected in the unstable lives of these women. This background contributes its share toward their many brief marriages, lightly undertaken and soon terminated, and their uninhibited sexual behavior, whether married or single. The social unrest attendant on the war has played its part in their lives as well. Many come from small towns and villages, this being a predominantly rural state, and many have been apprehended in the vicinity of large military establishments, where they have migrated, to work sometimes as food handlers or in other poorly paid positions and consort with the soldiers for extra earnings and for pleasure. About three fourths of the total number are committed under the state quarantine regulations, which prescribe that they shall be held for treatment until noninfectious.

The admission history, which includes questions as to symptoms of gonorrhea, state of health of contacts and previous treatment, is often of very uncertain value from an epidemiologic standpoint or as an aid in establishing the diagnosis. A large proportion of the women are unaware of their infection until medical examination reveals it, and few give a history of symptoms. The most common complaints are lower abdominal pain and a vaginal discharge, though the latter complaint occurs as frequently in the nongonorrheal as in the gonorrheal patients. The incidence of clinically detectable pelvic changes is higher in these patients than the symptomatic history would lead one to expect. It has been our experience that a clinical diagnosis is of uncertain value and that the presence or absence of clinically recognizable urethritis or cervicitis, particularly in the chronic infections, bears only a partial relation to the bacteriologic findings. Cervicitis and vaginitis from other causes are frequently encountered. This finding, in conjunction with the vague histories, often makes it impossible to date the onset of gonococcic infection or to determine its present stage. However, few of the infections in this group were considered acute.

On admission each patient received a physical examination, and a spread and culture were taken from both urethra and cervix. Cultures were taken from Bartholin's glands or rectum only in the presence of clinical changes warranting suspicion of infection. Appropriate tests for other venereal diseases, complete blood counts and urinalyses were performed. Bacteriologic tests for gonococci were repeated every other day, if negative, until a total of six had been taken, without interruption for the occurrence of a menstrual period. Indeed, through much of the study an effort was made to take at least one culture during a menstrual period, but experience has not shown this procedure to have great diagnostic value. After treatment and after six negative spreads and cultures performed over a two week period the gynecologic condition of each patient was determined by examination and, if a frank urethritis or vaginitis was still present, an attempt was made to clear this up by local therapy. Treatment was not continued, however, until all clinical signs of cervicitis had disappeared, partly because in our experience these have little relation to the bacteriologic findings but chiefly because in a rapid treatment program such a long observation period is not feasible. For the same reason, although no patients with acute or subacute pelvic inflammatory disease were released, some were discharged in whom the residual signs of such a process persisted.

After careful cleaning of the site, removing the mucous plug and massaging the cervix, cultures were made by streaking the secretions on the surface of the medium. The medium used was proteose number 3 agar and hemoglobin (Difco) fortified with glucose to make a final concentration of 0.2 per cent; 1 : 800,000 crystal violet and 5 mg. of para-aminobenzoic acid per hundred cubic centimeters. Glutamine [1] and liver extract growth accessory substances were added as suggested by Lankford.[2] Only a short time elapsed between the taking of the cultures and their incubation, which was in an atmosphere of about 10 per cent carbon dioxide at a temperature of 35 C. After forty-eight hours the cultures were inspected and were sprayed with para-aminodimethylaniline monohydrochloride, and those colonies which showed a positive oxidase reaction were stained with Gram stain and examined under the microscope. Carbohydrate fermentations were done only in exceptional cases.

In the group under consideration, treatment was never instituted except on demonstration of gonococci by culture at least once. In many instances gram negative intracellular diplococci were also found in the spreads. Every patient was treated with sulfonamides, even when there was a history of recent similar treatment. If the latter was given in the same type of institution as this center, it was considered in determining sulfonamide resistance in a few of the patients treated subsequently with penicillin. All results reported in the sulfonamide group, however, were obtained by

1. Lankford, C. E., and Snell, E. E.: Glutamine as a Growth Factor for Certain Strains of Neisseria Gonorrhoeae, J. Bact. 45: 410 (March) 1943.
2. Lankford, C. E.; Scott, V., and Cook, W. R.: Some Aspects of Nutritional Variation of the Gonococcus, J. Bact. 45: 321 (April) 1943.

ourselves. Each dose of medication was ingested under the supervision of a responsible member of our personnel. Most patients received sulfathiazole in either of two systems: 1 Gm. four times daily for five days or 2 Gm. four times daily for two days and then 4 Gm. daily for three days. In some instances sulfadiazine was substituted in the same dosage, but in our experience it was no better than sulfathiazole. We adopted the larger dosage schedule to compare it with that so generally used, 20 Gm. in five days. At first it appeared to produce more cures, but later experience did not bear out this impression and it was dropped because of the higher incidence of reactions. A period of five days elapsed between completion of a drug course and the taking of the first test of cure. If the culture was still positive and the white blood cell count not unduly depressed, a second course was given of either the same or the alternate drug. If this failed, the patient was considered sulfonamide resistant. In a few instances a third course was given alone, but usually there was recourse to other measures, such as combining a sulfonamide with nonspecific protein therapy. This consisted of a series of intravenous injections of enough typhoid bacilli to produce a moderate febrile reaction every other day for five days. About one third of the patients thus treated became culture negative. If one focus of infection was found which could be eradicated, this was attempted, but often with indifferent results, particularly in the cervix, where deep cauterizations were not undertaken. When other measures failed, artificial fever, eight to ten hours, at 106.6 F., with 6 Gm. of sulfathiazole administered during the preceding eighteen hours was used for 25 patients, with twenty-three known successes. After penicillin became available it was used in preference to other measures. In this series 10,000 units was injected intramuscularly every three hours for a total of 60,000 units. Failures were retreated with 20,000 units every three hours for a total of 120,000 units.

Part way through this study it became apparent that many of the maneuvers required to rid the white women of their gonococci were unnecessary in the Negroes. All the patients receiving artificial fever were white, as were all but 1 of those for whom penicillin was used. When case records were grouped on a racial basis the statistical differences shown in table 1 emerged.

Obviously, if such divergent results are shown to be the rule, any estimate of the effectiveness of a dosage schedule or amount of sulfonamide treatment must take into account the proportion and distribution of the racial components in the group under consideration. Thus the total cures for the whole group of 555 sulfonamide treated women, shown in table 2, would have been higher if the proportion of Negro to white had been reversed.

The initial advantage which the "intensive" sulfathiazole treatment scheme seemed to have over the "routine" may also be explained on a racial basis, since patients were treated just as they came and no racial differentiation was made in the tabulation of the early results. As shown in table 3, when this differentiation is made there is no statistically significant difference between the final results produced by these two methods.

This study includes, as well, 50 white women whose infection proved resistant to at least two courses, or a total of 40 Gm., of sulfonamide and who were treated with 60,000 units of penicillin. The results are shown in table 4.

Since the majority of patients were asymptomatic on admission, their reaction in this respect was no measure of the effectiveness of therapy. Some noticed a decrease in the amount of vaginal discharge. In others this remained unchanged, particularly in the presence of chronic cervicitis or nonspecific vaginitis, even though the gonococcus could no longer be recovered from the secretions. It may be noted, incidentally, that when vaginitis is associated with the presence of Trichomonas vaginalis the removal of clinical signs of this infection through treatment does not affect favorably the course of a gonococcic infection or make it easier to cure. Local treatment of the cervix by injection of a concentrated aqueous suspension of microcrystals of sulfathiazole with a fine needle directly into the cervical tissue, in a ring parallel to the cervical canal, failed in all of 5 cases.

In some complications of the adnexa and Bartholin's glands, sulfonamides failed to produce improvement. A larger number were improved clinically and symptomatically though still retaining gonococci in the cervix or urethra. Many patients with such complications were cured both clinically and bacteriologically. Chronic purulent infection of the urethra and paraurethral glands were apt to persist after gonococci could no longer be found by culture or spread. The patients themselves were practically never aware of such infections.

Reactions to sulfonamides were few and usually mild. In a number of instances sulfonamide therapy could

TABLE 1.—*Results of Sulfonamide Treatment by Racial Group*

	White (355)				Negro (200)			
	Cure		Failure		Cure		Failure	
Method of Treatment	No.	%	No.	%	No.	%	No.	%
1st course, 5 days	214	60	141	40	181	90	19	10
2d course, 5 days	34	27	91	73	10	53	9	47
Total cures	248	70			191	95		
Total failures			107	30			9	5

TABLE 2.—*Results of Sulfonamide Treatment in Entire Group*

	After 1 Course		After 1 or 2 Courses	
	No.	%	No.	%
Cure	395	71	439	81
Failure	160	29	100	19
Total treated	555		539*	

* Second course not given to 16 failures after one course.

TABLE 3.—*Comparison of "Intensive" and "Routine" Treatment Methods*

	"Intensive"					"Routine"				
		Cure		Failure			Cure		Failure	
Group	Total	No.	%	No.	%	Total	No.	%	No.	%
White	192	116	60	76	40	163	98	60	65	40
Negro	98	89	91	9	9	102	92	90	10	10
Total	290	205	71	85	29	265	190	71.5	75	28.5

TABLE 4.—*Results of Penicillin Treatment of 50 White Women*

	Cure		Failure	
Dosage	No.	%	No.	%
10,000 units every 3 hours for a total of 60,000	47	94	3	6

be completed by changing from one compound to another. Four instances of conjunctivitis occurred, usually after completion of the course. The only serious reactions were 3 instances of ureteral blocking; all occurred in patients on the intensive dosage, relatively early in the course and during very hot weather. After precautions were adopted to maintain an adequate fluid output, no more were seen. Early hematuria necessitated stopping the drug in 3 other patients.

COMMENT

In spite of the impression, so long and so generally held, that gonorrhea in women is more difficult to cure than in men, the figures here presented indicate that under controlled conditions this is not the case. Our results are strikingly parallel to those reported by Turner and Sternberg [3] for the Army, both in the series as a whole and in the separate racial groups. Their figures and the recent discussion by Pelouze [4] emphasize and support an impression apparently held by some Southern clinicians for a long time, that gonorrhea in the Negro was easier to cure than in the white person. No explanation of this difference, the reality of which now seems well established, is offered. Whether it is due to the infection of Negroes in general with strains of gonococci more susceptible to the action of sulfonamides than those found in white patients, or whether there is a higher racial immunity, cannot be decided without more evidence than we now have. If strain susceptibility is the reason, a reduction of the proportion of cures that can be obtained in Negroes with sulfonamides may be expected as the more susceptible strains die off, acquire sulfonamide resistance through exposure to sublethal concentrations of the compounds or are replaced by strains already resistant. If racial immunity is the explanation, its importance in problems of treatment and control is evident. Two important questions deserve further study, namely, whether the superiority of results with sulfonamides in Negroes will be maintained and whether the Negro race will respond relatively as much better to other treatment measures. At any rate, since much can be accomplished with the sulfonamides in women, Negro or white, they remain a useful therapeutic weapon, though not the most effective that has been or will be developed.

SUMMARY

1. Results of sulfonamide therapy, chiefly sulfathiazole, in 555 culture positive gonococcic infections in institutionalized women, are as follows: In 200 Negro women 90 per cent passed the tests of cure after one course of treatment and 95 per cent after two courses. In 355 white women 60 per cent passed tests of cure after one course of treatment and 70 per cent after two courses.

2. These results correspond closely to those recently reported with both Negro and white men in the Army.[3]

3. The evidence presented here indicates that under controlled conditions the bacteriologic cure of gonorrhea with sulfonamide compounds is as readily brought about in women as in men. This is true also for penicillin.

4. An explanation of the difference in response to sulfonamide therapy between Negro and white patients must await the results of further investigation.

Rapid Treatment Center.

3. Turner, T. B., and Sternberg, T. H.: Management of the Venereal Diseases in the Army, J. A. M. A. **124**: 133 (Jan. 15) 1944.
4. Pelouze, P. S.: Progress in the Wartime Management of Gonorrhea, Ven. Dis. Inform. **25**: 42 (Feb.) 1944.

WARTIME EXPERIENCES IN HAWAII AFTER THE BLITZ ON PEARL HARBOR

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In Hawaii, as in the rest of the world, the average person does not consider public health to be one's business; only when a major epidemic or disaster threatens does one become interested in, helpful to and critical of the local health board. Let the threatened calamity be brought under control, and Mr. and Mrs. Average Citizen again relax and become involved in more personal interests.

The definition of "public health" should be self explanatory in that it is health for, by and of the people and this simple fact should and must be recognized by people generally in communities throughout America—yes, throughout the world. Public health cannot be left to the public health services or to the professional worker alone, for it is the business of each one of us. It must be part of an overall community plan, as is fire protection or police protection. Laws must be enacted and violations must be punished. Public opinion must be aroused, and not only the medical men but every citizen must take an active interest. The interest of boys and girls at school, of the churches, of the employer and the employee must be aroused, and the newspaper and radio must carry the banner under the leadership of the local health agencies, both public and private. Let it be fashionable or profitable to be healthy, and a good start will have been made.

The local health official, frequently operating with an inadequate staff, finds himself limited in the extent to which he feels able to go without public interest behind him. To get this he needs the help of volunteers. He needs community backing. Such a project as this might very well engage the attention and active participation of all the chambers of commerce in communities throughout America. It is important, it is interesting, it is profitable. Healthful communities are fine communities in which to live and work. It pays dividends not only through happier lives but also by reducing loss of man hours.

Notable among the worthwhile achievements concerning public health in the Territory for the past many years has been the work of the public health committee of the chamber of commerce. I have been chairman of this committee for the past eight years and as such have at all times tried to promote the best interests of the medical profession in its relation to the health and welfare of the community. Having served in key positions with the medical societies over the past twenty-five years, as well as having managed the blood bank for the past three years, I have come to the conclusion that medical men individually, and all too frequently, collectively have shown an abysmal lack of interest and concern over the health affairs of their community. Our public health committee has more than adequate finances and has promoted such major projects as health legislation, mental hygiene, reorganization of the leprosy program, dengue fever control, poliomyelitis control, mosquito and parasite control, plague control, tuberculosis surveys, the original prewar blood bank and numerous other investigations and studies of major or minor importance to the extent that more than a million dollars has been expended by

the chamber of commerce health fund over the past several years in the interest of making Hawaii a better place in which to live.

The members of the medical profession have gradually come to accept and to appreciate the success of many of these projects, though at intervals in the past there has been keen opposition by them to some of the things which the members of the public health committee were endeavoring to do.

Our public health committee of the chamber is a unique organization in that no other organization, to my knowledge, has such funds. During the great plague epidemic in 1900, at which time a large part of the city of Honolulu was destroyed by fire, the shippers inaugurated a system of collecting a voluntary tonnage contribution of varied amounts from all persons receiving freight across the wharves in Honolulu. This procedure had the sanction of the courts and has been continued. This income, amounting to as much as $100,000 in one year, has been available to the chamber of commerce through its health committee to expend for health improvement in the Territory, chiefly in the city and county of Honolulu, so that our community is in a position to finance immediately any project which suddenly requires attention, such as an epidemic or disaster, ordinarily taken care of by taxpayers' funds but which would ordinarily not be available without slow and unwieldy special legislation. The members of this committee have full power to act and are subject to no regulation other than public opinion.

SHORTCOMINGS OF MILITARY RULE

A powerful influence on both the public and the private health of Hawaii and its peoples has been martial law and the blackout. On the day of the blitz, Dec. 7, 1941, one of the first official acts of the governor was to declare martial law for the Territory. This was done before noon on December 7. Since that time there has been much controversy and no small amount of ill will created between the military and the civilian population regarding certain phases of the regulations. I think it is generally agreed that the civilians of the Territory were entirely favorable to the institution of martial law in the early days following the blitz. I wonder how many realize just what such a drastic regulation means to the way of life of any civilian who has not been accustomed to such regimentation. It means, in short, that everything a civilian does and says is subject to regulation by the military authorities. We in Hawaii have learned from experience that the military authorities fall far short in their understanding of proper methods to administer the purely civilian affairs of a community. While it is admitted that such drastic measures were necessary, it is also generally agreed that the methods of carrying out the necessary regulations were, many times, unnecessarily drastic and unreasonable. This naturally results when military officer executives are appointed who had had no experience with martial law on such a large scale nor any background or knowledge of the problems peculiar to that community. It is something that one is sorry to have endured, even though the experience probably has been valuable. One certainly becomes appreciative of its modifications.

All are no doubt familiar with the litigation relative to the operations of the provost court and the suspension of habeas corpus in Hawaii. Our experience with military rule convinces the large majority of us that a commission form of government is not desirable for the people as a whole. On the contrary, our experience is the best recommendation for a continued form of democratic government. This must not be construed as a criticism of the military during the trying days after December 7. Those were critical times, and prompt and drastic action was required. There was not only the fear of attack from without but also the fear and uncertainty of attack from within, considering that we have in the Territory approximately 163,000 Japanese, 35,000 of whom are aliens and 64,000 of whom have been catalogued as enjoying dual citizenship.

One can readily understand how grave the situation might have been. Yet there has been little evidence of sabotage or organized effort to thwart the authorities in Hawaii. Immediately after war was declared on Japan the Army and Navy Intelligence, in cooperation with our own local police force and the Federal Bureau of Investigation, rounded up not only the Japanese but others as well who were known to have subversive leanings. Large numbers of these people were incarcerated as internees and subjected to a complete and thorough examination. Those found undesirable were sent either to the mainland for location in internment camps or to internment camps in the Territory. I think it is safe to say that every citizen in the Territory, regardless of racial descent, has some sort of an FBI record in the files. Some, of course, have been investigated much more critically and completely than others —and the constant fear of investigation and subjugation caused a high percentage of apprehension and mass depression.

Immediately after December 7, under orders of the military governor, every person in the Territory, from the oldest to the youngest, was compelled to have a certificate of identification issued after a comprehensive examination, including fingerprinting. Regulations made it mandatory that at all times, day or night, an identification card must be in the possession of the individual to whom it was issued. Every one—and I do mean every one—with a few exceptions was vaccinated for smallpox and given a series of typhoid injections early in 1942 by military order. Booster shots for typhoid before June 15, 1944 have now been ordered by the civil government.

INCONVENIENCES OF THE BLACKOUT

The blackout has probably been the greatest objectionable feature, because during the winter months the total blackout regulations for the Islands started at sundown, which is in the vicinity of 6 o'clock, and lasted until as late as 7:15 in the morning. This meant that all houses had to be blacked out, and when I say blacked out I mean thoroughly and completely, because there was always a guard to see that one did not have even a slight crack of light showing from the premises. If any light showed there was often no warning; one was taken to the police station and the provost judge imposed a fine from $25 up, depending on his disposition at the moment. The second or third offense meant a stiff fine, and in many instances jail sentences were imposed. The blackout in the Territory was total and complete. This, of course, was a great hardship on people of the poorer class, because their houses were not built for such arrangements and during the hot nights people would sit in one small blacked out room sweltering from the heat and lack of ventilation.

Strangely, this did not, according to our public health records, increase our upper respiratory health conditions materially—a thing we could not understand, although we feel that it has been a contributing factor to the increase in cases of tuberculosis. It did, however, produce an increased amount of mental illness and morbidity in that direction. There were several reasons for the enforcement of such a drastic rule: the fear of attack by airplanes or ships at sea; such a regulation completely prohibited people from gathering in groups; it saved electric power urgently needed in defense projects. No one could be on the street after blackout except those engaged in essential operations, and they had to be in possession of a pass which gave them this privilege. Under no conditions were aliens ever permitted on the streets after blackout.

Gradually this regulation has been modified to the point where the curfew begins at 10 o'clock, and for the past month we have been permitted to leave our light on all night if we so desire. We are grateful for this privilege, and most of us subscribe to the argument that the blackout was probably a good thing in spite of the personal inconvenience it caused.

MENTAL HYGIENE

The physical health of any community is influenced by the mental health of its members, and this has been amply demonstrated in Hawaii since the war.

Some of our leading internists have this to say about internal upsets: "We are finding a great many more cases of general gastric and intestinal irritability, associated with much evidence of vascular instability, shown by swelling of the stomach and the intestinal or gastrointestinal membrane as shown by x-rays. This condition we have also found will be frequently associated with ulcer symptoms and frequently superficial ulceration which may go into deeper ulceration. The picture is variable. Quite sizable ulcers frequently disappear in the course of a few weeks, apparently recurring with increased mental worry or fretting over abnormal conditions. There are definitely ten times as many of these cases since the war. War and abnormal conditions have had a definite effect. Patients respond to treatment and rest."

It is suggested from our experience in Hawaii that there is more and more to the theory of an acute allergic phenomenon resulting from or associated with conditions of life which increase nerve tension. It is an interesting observation that when a patient is removed from the environment of extreme nervous tension many of his allergic symptoms disappear completely.

One large group of problems is that which includes the problems connected with the uncontrolled, promiscuous employment of women who are the mothers of many small children. At the same time we have been receiving impressive documents from Washington entitled "The Children's Charter," setting forth all the precautions to be taken to insure proper mental health for children in wartime. We see our local federal agencies employing the mothers of as many as eight children, which children are then turned loose on the community without supervision, and no children's organization had or was provided with the facilities for their care. A great deal of the damage to children resultant on this kind of occurrence is not shown in the juvenile delinquency statistics.

Another contributing factor has been the war workers brought here from the mainland. The recruiting program for these workers has been so handled as to provide practically no consideration of the individual's history or ability to adjust to conditions here. A large number of emotionally immature persons have been brought to Hawaii, and they have not got along well. A number of psychopathic personalities, alcoholic addicts, feebleminded persons and even psychotic individuals have been brought here by the federal agencies. The adverse conditions under which these war workers live contributed to the mental hygiene problem of this group.

Bad thinking on the part of the military and the local civilian government with regard to providing housing conditions for 75,000 people is responsible for the thousands who are living in tents, shacks and holes in the wall.

We are told that Honolulu is the most crowded city in the whole United States. It is quite as important to provide shelters for the civilian population as it is for the service personnel. Housing facilities for the civilians are wofully lacking in Honolulu.

It has been estimated by qualified observers that in Hawaii, just as it is reported to exist throughout the mainland, there is a very high percentage of inefficiency of voluntary war work among the civilian population.

PREPONDERANCE OF MEN

There is a general attitude of taking advantage of the benefits made possible by the war. I speak especially of the so-called volunteer workers. The great preponderance of the male population in our Territory is well known. Quoting from one of our best authorities, one does not have to look far to note the unhealthful effects of this on the women as well as on some of the men. This is not confined to young women: the woman over 35 has come into almost a second youth as far as masculine attention is concerned. The woman who has considered herself settled as a "wife and mother" has become socially more desirable and economically independent. When some women are suddenly given increased social status, desirability, importance and contacts always considered unavailable to her, it is not unusual to find her showing a new independence and lack of cooperativeness at home and at work. As far as the women are concerned, there seems to be a keen rivalry among the varied organizations requiring the wearing of a natty uniform. Private surveys involving thousands of men in the armed services indicate that only about 6 per cent of them demand female companionship, while 42 per cent want more sports facilities, 40 per cent want more movies and other small groups want art, photography or music. The demand by this small percentage of the overwhelming male populace for the companionship of women very easily throws otherwise stable individuals into a state of self aggrandizement and makes their contribution to the war effort secondary to their personal ambitions, which they subscribe to under the guise of patriotism and with the license that goes with it. It therefore appears that a tremendous amount of woman manpower effort is being expended for an insignificant number of men in uniform—far in excess of rational and reasonable requirements and to the detriment of many other less alluring activities.

My remarks should be modified with respect to certain volunteers, both men and women, who are doing their jobs well, and against whom no criticism should be leveled. However, if the social life that they are engaged in extracurricularly is so demanding and excessive as to render them inefficient in their full time

occupations, then the influence of the war in Hawaii has been definitely disastrous. I have a great respect and admiration for those women who are economically independent, who serve so efficiently and well in the various hospitals as nurses' aides. Many features of such work are distinctly undesirable and distasteful to women of this class, yet we find them putting in their capacity hours each day of the week and rendering an invaluable aid to the various institutions. People engaged in such activities do not need a brass band or self declaration to tell of their contribution to the war effort, because their efforts are measured and recorded by the agency to which they are assigned. We call this type of service in Hawaii measured and measurable patriotism. There are many other organizations, connected and not connected with hospitals, doing equally superior work.

Owing to the preponderance of the male population and to the fact that many men are in Hawaii without their families and are lonely and eager for companionship, with plenty of money to spend, too often the wife has found release from a humdrum existence with a suddenly uncongenial husband and left her home and family for an adventure that is happier for the moment with a mainland war worker or a member of the armed forces. She is entertained and amused and she enjoys it thoroughly. The fact that such a relationship is temporary as well as immoral doesn't seem to matter. Naturally her actions and attitude have a profound effect not only on her children but on her friends and the community. She may think that she is "getting away with it" until the great awakening.

DIFFICULTIES OF READJUSTMENT AFTER EXILE

The thousands of local citizens who were practically forced to leave the Territory during the early days of the blitz are gradually returning to Hawaii at the pleasure and will of the Army and Navy. This has been probably one of the greatest disrupting factors, but this disastrous state is gradually being corrected. Many men who sent their wives and children away soon after the blitz, with the best of motives, have found adjustments difficult to make with the long last returning of their wives and families.

EPIDEMICS

The tremendous number of defense workers and Army and Navy personnel which has flooded Honolulu has brought to our acute attention the grave problem of venereal disease control. Fortunately our local board of health has splendid cooperation with the health departments of both the armed services. Otherwise our excellent record could not have been achieved and maintained.

For many years Hawaii has had lower than average venereal disease rates. Long before the onset of the war, board of health regulations were issued which made it obligatory to report all new cases of venereal disease—civilian, Army or Navy—to the health department within twenty-four hours after diagnosis, along with information as to the suspected sources of the disease. Since the blitz a military order has been issued along the same lines. The health department assumes the function of investigating such suspected sources.

To prevent infection among the armed services, educational activities were sharply accelerated. Hundreds of thousands of pamphlets were provided by the health department for distribution to service men. Adequate prophylactic facilities were provided by the Army and Navy and made available to civilians.

Along with efforts to reduce the incidence of disease in the many thousands of soldiers and sailors stationed in and advancing through Hawaii, case finding and educational activities for the civilian community have also been augmented.

Since the summer of 1942 there has been a decided increase in public interest concerning venereal diseases. Newspapers have devoted considerable news space and some editorials on the subject, and all radio stations in the Territory have provided free time for the release of venereal disease broadcasts. This change of public attitude was reflected in the passing of the Prenatal Blood Test Law by the 1943 session of the legislature.

In cooperation with the Department of Public Instruction, classroom teaching about the venereal diseases has been instituted in the high schools. As far as possible this instruction is integrated with that concerning other communicable diseases. There has been a compulsory chest x-ray examination of all food handlers. A Wassermann test has been done at the same time in an effort to promote the control of venereal diseases.

Incidence of tuberculosis deaths in 1940 was 63 per hundred thousand, based on a population of 426,654. In 1943 this had dropped to 56 per hundred thousand, based on an estimated population of slightly more than one-half million. This indicates that the effect of the war on the incidence of tuberculosis deaths has not been adverse.

However, there is a definite increase in the number of tuberculosis patients in the Territory. It is estimated that in 1940 there were 1,474, whereas in 1943 this had increased to 1,949. The patients hospitalized in sanatoriums throughout the Territory were 860 in 1940 as against 1,063 in 1943.

Contributing factors of the increase are, of course, increased population and the large numbers of defense workers, the majority of whom had totally inadequate physical examinations. The majority of these people are located in and around Honolulu. There was also a large migration from the outside islands to Honolulu for war work. Overcrowding is probably the greatest single factor in this increased incidence of tuberculosis. The stress of modern living, prolonged physical and emotional fatigue, overcrowding, poor ventilation resulting from blackout restrictions, bad eating habits, lack of recreational facilities and overindulgence in alcohol greatly contributed to the increased number of cases of tuberculosis. Though an improved system of case finding has been adopted by the board of health, it is generally considered that this has not been the sole reason why so many new cases have been discovered.

Forty-three thousand 4 by 5 inch films have been taken since 1942, the majority of these being of the draftees and the food handlers, who by law are compelled to submit to a chest x-ray examination. In Hawaii 2 per cent of our draftees presented x-ray evidence of tuberculosis, as did 3.5 per cent of the food handlers. It is estimated that there is a bed shortage for cases of tuberculosis in the Territory of approximately 1,000. Honolulu at the present time seriously needs from 400 to 500 additional tuberculosis beds. But if we had these additional beds we would not be able to supply personnel sufficient to care for the patients, as all of our formerly available help are now engaged in war work at fantastic salaries, and more glamor and excitement are attached to these war positions.

The following observation is interesting and has a direct bearing on the increased demand for medical care: An analysis of the statistics from our community clinic indicates that since 1939 the number of charity patients visiting this clinic has diminished more than 60 per cent, though the cost of each individual visit is exactly double in 1943 what it was in 1939. In 1939 it cost us 78 cents per visit for 72,169 visits, while in 1943 it cost us $1.57 each for 34,591 visits.

A dengue fever epidemic began in the Waikiki district in the early part of 1943. The total number of cases, exclusive of the military cases, was 1,485 as of May 3, 1944. Assisted by specially trained corpsmen of the U. S. Army, two hundred persons are constantly at work in the control of dengue.

An epidemic of poliomyelitis started early in 1943, and an emergency hospital was set up originally by the Office of Civilian Defense in April 1943 on the ground of the Shriners Hospital, when there were 58 patients. On Sept. 1, 1943 the Emergency Poliomyelitis Hospital was formally taken over by the Aloha Temple of the Shrine and conducted as a separate institution from funds of more than $200,000 donated by the public for the emergency. To date 100 patients have been admitted, the average daily cost per patient being $17.25. The epidemic soon abated and at the present time there are but 4 active cases.

THE BLOOD BANK

So much has been said about the part played by the Civilian Blood and Plasma Bank at the time of the blitz that further information may be desired concerning the operation of the blood bank since that time. This bank was in operation for almost a year before the blitz.

One of our aims, when we could gather our forces together after the blitz, was to determine the blood type of every resident in Hawaii. We have fallen far short of that aim but are pleased to report that approximately 250,000 blood typings have been done. Our statistics clearly demonstrate that race influences the blood type of an individual, although we cannot determine race by blood. International averages show 43 per cent O, 40 per cent A, 12 per cent B and 5 per cent AB. Our percentages follow quite consistently, 36 per cent O, 39 per cent A, 18 per cent B and 7 per cent AB.

Owing to the blackout conditions and the military order forbidding citizens to be on the streets during the blackout hours, Honolulu was faced with the difficulty of providing emergency blood transfusions. So immediately after the blitz the blood bank, operating then under the direction and control of the Office of Civilian Defense, instituted a whole blood and plasma transfusion service readily available to all the hospitals in and near the city. At our main blood bank on the Queen's Hospital grounds, donors were received, and after all the necessary laboratory work was done on the bloods they were then distributed to the various hospitals to be kept under refrigeration pending their need. This was a godsend to the people of Hawaii. Out of that emergency need we developed a lend-lease plan whereby blood from our central stores could be used at any time on any and all patients and in such quantities as were required, the only condition being that this blood be replaced by a friend or member of the patient's family, who was required to give his blood at the central bank. To date, approximately 30,000 donors have been received at the Honolulu Blood and Plasma Bank. The excess of blood that is not used for whole blood transfusion is returned to the central bank within seventy-two hours and processed into plasma.

On Oct. 1, 1943 the operation of the blood bank under the Office of Civilian Defense was turned over to a board of directors of an organization chartered by the Territory, and it has been maintained since that time on an independent self-supporting basis. We have enjoyed excellent cooperation from the Army and Navy medical departments. Approximately one half of our donors come from the people in the armed services, who, of all people, have come to appreciate the importance of plasma and blood transfusions. No charge is made to the armed services for the use of blood or plasma. We give to the various hospital units and the ships at sea as much blood and plasma as they ask for, without charge and without red tape. Our budget per month runs in the vicinity of $5,000. This money is raised from service charges of $5 per dose of blood and $10 per dose of plasma, when the amount borrowed is replaced; and from direct charges to patients who are unwilling or unable to send in donors to replace the blood or plasma used, at the rate of $20 per dose for blood and $25 per dose for plasma. In these lucrative times, when every one has money, we have been faced with the situation on several occasions when we had more money than blood. People often prefer to pay us as much as $300 for blood that has been used in an especially severe case than to send in, say, fifteen donors to replace it. On several occasions we have been compelled to use prison donors, whom we pay $10 for each donation. This is done only when our supply of donors runs short because of cash payments. In order to have a cash reserve for emergency needs, as director of the blood bank I made a personal appeal to a few prominent business corporation heads, and within three days $20,000 was donated, which we are using as a revolving fund on a reserve basis.

An interesting observation has been made with regard to the percentage of serologic tests done on all donors since the beginning of our bank. In the first year of operation more than 5 per cent of our donors showed a positive Kahn or Wassermann reaction. When such a report is found, in cooperation with the board of health, measures are immediately taken to put the patient under treatment, and, of course, he does not return to the blood bank again because we have advised him that his blood is unsuitable, but we have accomplished a great public health benefit as a case finding agency among a large number of people, who perhaps were ignorant of the fact that they had a syphilitic infection. With each succeeding year, since our early days, there has been a noticeable drop in the percentage of positive Wassermann and Kahn reactions. Since December 1942 we have used the Kline exclusion test on all donors, and only those bloods which are Kline negative are used for whole bloods. Doubtful and positive Klines are checked by the Kahn standard test, and those bloods which are negative Kahn are used for plasma.

We have built up a reserve of plasma to be used at a time of disaster, such as another blitz, and the Peacetime Blood and Plasma Bank, which has existed since Oct. 1, 1943, has accumulated a considerable reserve of plasma for local and emergency needs.

The blood bank has been responsible for making anti-Rh serum available to all service and civilian hos-

pitals. The blood bank has itself done Rh testing on some 1,500 donors and has developed a register of Rh negative donors of all four blood types. In this connection it is interesting to note that the percentage of Rh negative persons among Caucasians is the same as that found by the Certified Blood Donors Service, i. e. 15 per cent, but so far we have found only one Oriental who is Rh negative, and not any Filipino or Hawaiian-Oriental who is Rh negative.

The blood bank has sponsored the use of specific substances A and B, developed by Witebsky and his associates. Ten cc. of these substances is added to type O blood so that it can be given in emergencies when the patient's type is unknown, without cross matching. We have also found that "treated O," as we call this blood when the substances are added, can be used for specific type patients without reaction and, in fact, to advantage when it is difficult to secure a compatible blood in subgroup patients. We are now using more than 50 "treated O" bloods per month, out of a total of approximately 400 bloods per month.

PROCUREMENT AND ASSIGNMENT

Since my appointment as chairman of the board of Procurement and Assignment Service for Physicians for the Territory of Hawaii we have met once each week for the purpose of determining the availability of physicians for military service or their essentiality to the community. One major conclusion should be mentioned. The board of the Procurement and Assignment Service feels unanimously that its responsibility in keeping a man out of the service if he desires to go in is even graver than it is in making him available for military service and forcing him into the Army or Navy when he does not want to go.

The geographic location, the varied races involved and the new people that are constantly coming to Hawaii on defense projects have made our problem in Hawaii particularly and peculiarly difficult. The facts that a large percentage of our population is of Japanese ancestry and that 30 per cent of the physicians of the Territory are of Japanese ancestry have made our problem in this regard unique. Since Japan is our enemy, it is understandable that the Army and Navy are rather loath to accept commissioned officers of Japanese ancestry, even though they may be American born and have good records. On the other hand, the board of the Procurement and Assignment Service is confronted with this great dilemma: If the Japanese physicians are not acceptable to either of the armed services, and if our percentage quota of doctors per thousand of population is such that we can spare medical men for the services, then the ratio of doctors per thousand for the various racial groups will be thrown entirely out of balance if only our Caucasian doctors are accepted in the armed forces. Such a situation then resolves itself to this conclusion: that because they are Japanese they are literally enjoying protection and immunity and are being given a favored place in the scheme of things, since they are allowed to remain behind to build up lucrative practices which should belong to Caucasian citizens rather than to alien Japanese physicians or American born Japanese not acceptable for military duty.

The operation of the Selective Service laws as now being conducted in the Territory make no racial distinctions. Japanese are inducted alike with all the other races. The board of the Procurement and Assignment Service finds it very hard to reconcile the attitude of the Surgeon Generals in refusal to accept Japanese commissioned officers when they do accept in the Army Japanese draftees and volunteers. The board of the Procurement and Assignment Service therefore has come to the conclusion that it cannot, in fairness to the citizens of Hawaii who also need good medical care, certify as available only a large number of Caucasians, to the detriment of the white population and to the distinct advantage of the Japanese race. It is to be noted here, in fairness to the American born Oriental physician, that a large number of these boys are very desirous of entering the military service if for no other reason than to show the American public that they are good American citizens.

To date 36 physicians from Hawaii have already entered the armed service, and 37 additional physicians have been certified as available. Of this number 19 are Caucasian, 3 Chinese and 15 Japanese.

All Hawaii has been rated as number 1 for critical wartime classification purposes. From my remarks you can understand just how disastrous has been and continues to be the effect of the war on Hawaii. As an outpost for national defense, as a supply port for all Pacific operations and as a rest and recreational zone for the millions of service men, you can readily understand the tremendous changes that must have taken place in our formerly peaceful islands.

1013 Bishop Street.

Clinical Notes, Suggestions and New Instruments

REACTIONS FOLLOWING MASS ADMINISTRATION OF SULFADIAZINE

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Because of the large number of persons involved and the importance of learning the frequency of reactions following the administration of sulfadiazine, this report seems justified. As a prophylactic against pneumococcic, streptococcic and meningococcic infections 25,000 men and women were each given a single dose of 2 Gm. of sulfadiazine during a five day period in December 1943. Thus an unusual opportunity was furnished for observing sulfonamide reactions.

The drug was given under the supervision of a medical officer as a single dose of 2 Gm., in most cases immediately after breakfast. Those receiving it were instructed to drink two glasses of water and to refrain from exercise and alcohol for twenty-four hours. The men were instructed to report any untoward effects and, if known to be sensitive, were advised to refrain from taking the drug until such cases could be individually investigated. As is inevitable, however, in such a large number of persons, a few who knew they had had reactions previously did take the drug, and these persons developed the most serious group of reactions.

A total of 128 reactions (0.51 per cent) came to the observation of the medical officers. Of these, 9 (0.036 per cent) were serious enough to require hospitalization. Four more were listed as serious but hospitalization was not done, making a total of 13 (0.052 per cent) in this group. An additional 115 (0.41 per cent) of "mild reactions" were seen in the dispensaries. These can well be described by groups as (*a*) mild, cutaneous, (*b*) mild, general, (*c*) severe, cutaneous, (*d*) severe, general, and (*e*) serious, general.

(*a*) *Mild, Cutaneous* (15 patients).—These were persons who exhibited a mild, generalized erythematous or follicular rash of short duration. It is likely that there were a good many more of these that did not come under observation. An interesting

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feature was that almost all of these showed a greater or less degree of conjunctival injection, which was a definite feature of the more severe cases. The only treatment advised was to take a large amount of water.

(*b*) *Mild, General* (100 patients).—These persons complained of a variety of symptoms, in the order of frequency malaise, nausea, diarrhea, vomiting and faintness, which were attributed, either by the patient or by the medical officer, to the drug. It is not unlikely that other causes may have been operative in some of these men, and, in view of the fact that they were warned to be on the lookout for untoward symptoms, the psychic factor cannot be disregarded. Rest and a high fluid intake were the only therapeutic measures, and all this group were well within twenty-four hours.

(*c*) *Severe, Cutaneous* (4 patients).—Two of these patients developed an exfoliative dermatitis which required treatment over a period of days. Both of them had had previous reactions to the drug, 1 of them having developed an exfoliative dermatitis on a previous occasion when he had a local application of a sulfonamide in an ointment. Two others developed edema, somewhat suggestive of angioneurotic edema, which, however, yielded readily to injections of epinephrine.

(*d*) *Severe, General* (6 patients).—It seems best to list these separately, with a brief summary of each case:

CASE 1.—The man received 2 Gm. of sulfadiazine at 3 p. m. Chilly sensations occurred at 7 o'clock. He was admitted to the hospital at 9 p. m. with a temperature of 99.6 F., weakness, malaise, mental haziness and depression. No abnormal physical manifestations were observed except conjunctivitis. Treatment consisted of forced fluids. The temperature the next afternoon was 99.6 F. The patient was normal and asymptomatic on the third day. The most evident symptom was mental confusion.

CASE 2.—Two grams of sulfadiazine was administered at 2:30 p. m. Chills occurred at 7 p. m. The patient was hospitalized at 8 o'clock with a temperature of 99.6 F., clouded sensorium and conjunctival injection, but no rash. He had taken the drug in September 1943 and his temperature rose to 104 F. afterward. He was afebrile and asymptomatic at twenty-four hours. Treatment consisted of forced fluids.

CASE 3.—A woman was given 2 Gm. of sulfadiazine at 10 a. m. She had pain in the eyes and lacrimation at 1 o'clock with chills and fever to 101 F. At 7:45 a generalized rash appeared, swelling of the eyelids and upper lip and a temperature of 102.4 F. (maximum). The fever lasted thirty-six hours. At 4:30 p. m. there was generalized edema. By next day all swelling except that of the hands had disappeared. Forty-eight hours later the patient was practically normal again. She had taken a sulfonamide compound in July 1943 for otitis and had a rash at that time which lasted for three days and looked like measles but with no conjunctivitis at that time.

CASE 4.—The patient was given 2 Gm. of sulfadiazine at 10 a. m. He was admitted at 3 o'clock with headache, vomiting, loose stools, chills, fever, photophobia, a temperature of 103 F. by evening, which was normal next morning, the skin showing a general blush and the conjunctivas much injected. In June 1943 he had been given sulfadiazine and developed "measles" two days after stopping the drug. It is not certain whether this really was measles or a reaction.

CASE 5.—Two grams of sulfadiazine was given at 9:30 a. m. By afternoon burning and itching of the entire body occurred. At 4 p. m. the eyes were swollen. Physical examination showed considerable edema of the face, lip and orbital regions, with edema extending down in the neck. The concentration of sulfadiazine was 4.1 mg. per hundred cubic centimeters of blood. Epinephrine was given, and the edema promptly subsided.

CASE 6.—Two grams of sulfadiazine was given at 9:30 a. m. By noon intense general redness of the skin and pronounced edema of the feet and legs half way to the knee had developed, with exfoliative dermatitis the next day. The patient had moderate general malaise, with a temperature of 99.6 F., anorexia and slight nausea. The dermatitis still persisted after two weeks. General symptoms subsided in thirty-six hours.

(*e*) *Serious, General* (3 patients).—CASE 1.—A man aged 31 was given 2 Gm. of sulfadiazine at 4:30 p. m. Headache, dizziness and pains in the joints and legs had developed by 6:20 and fever at 7 o'clock, with chills and generalized pains, which were very severe; the legs were stiff. He was at his home. He went to bed at 11:30. His temperature was 102 F. He went to sleep. At 1:30 a. m. he vomited; his temperature was 104 F. He called the medical officer next morning and was admitted to the hospital semicomatose, going on to coma, the temperature 104 F., rising to 105.8. Physical examination showed general flushing of the skin, generalized edema, pronounced swelling of the finger tips and conjunctivitis. There was no pulmonary edema. The patient was comatose about six hours and then decidedly irrational. Breathing was difficult, with audible rhonchi. A generalized maculopapular rash developed. Intravenous dextrose was given, epinephrine and atropine, with continuous oxygen inhalations. The patient came out of coma in about twenty-four hours. The temperature, which reached the highest point, 105.8 F. rectally, twenty-four hours after the drug was taken, dropped to 103 the next day, 99.6 the third day, and was normal on the fourth day. The patient was critically ill for thirty-six hours but went on to complete recovery. He had taken sulfadiazine before, in June 1943, when he developed a temperature of 104 F. and a generalized rash, both of which cleared up promptly after the drug was stopped.

CASE 2.—Two grams of sulfadiazine was given at 6. p. m. Next morning chills and fever had developed, with general malaise and headache. The patient collapsed and entered the hospital at 7 p. m. Physical examination showed slight edema of the skin of the face and lips, flushed face and red pharynx. The temperature was 104 F. on entry, rose to 105.6 by evening and was normal the next day. The patient was treated with intravenous dextrose and epinephrine and went on to uneventful recovery in three days. Moderate stupor was present during the febrile period. There was no history of previous sulfonamide administration.

CASE 3.—Two grams of sulfadiazine was given at 9 a. m. At 9:30 the patient became dizzy, and his throat was parched. At 10:30 he could not walk because of vertigo and became unconscious. He was admitted to the hospital at 1 p. m. with pain in the chest, dyspnea and delirium. Owing to misapprehension of his condition he was given two additional doses of sulfadiazine, 2 Gm. and 1.5 Gm. four hours later, and his condition became worse, with coma and severe dyspnea. Sulfadiazine was stopped. He was given intravenous dextrose, and his condition improved rapidly. His temperature fell to normal on the third day, and on the fourth day he was entirely normal. He showed a scarlet flush of the skin, edema of the eyelids and upper lip, and mild conjunctivitis. The concentration of sulfadiazine was 10.7 mg. per hundred cubic centimeters of blood and 5.7 mg. per hundred cubic centimeters of spinal fluid. He had two previous reactions to sulfadiazine in April 1943 and July 1943, on each occasion having fever, vomiting and stupor.

COMMENT ON SERIOUSLY ILL PATIENTS

The remarkable feature of these 3 cases was the high fever and the mental state, which ranged from coma through delirium to mild confusion. Patient 1 of this group was critically ill and might easily have died had not proper therapeutic measures been instituted. It is noteworthy that most of the seriously ill patients gave a history of previous administrations of sulfonamide drugs and previous reactions. As soon as close medical supervision was given to the administration of sulfadiazine, and persons who were known to be sensitive were thereby discovered and prevented from taking the drug, there were practically no more of the serious febrile reactions.

SUMMARY AND CONCLUSIONS

After 2 Gm. of sulfadiazine was administered to 25,000 persons, 0.50 per cent showed reactions, 0.036 per cent showed serious reactions and 3 patients were critically ill.

Treatment with intravenous dextrose and epinephrine was efficacious in the severe reactions.

No cases of urinary suppression or of agranulocytosis were observed.

A careful history of possible previous sensitization should be obtained before sulfonamides are administered.

Council on Pharmacy and Chemistry

PATHOGENIC BACTERIA, RICKETTSIAS AND VIRUSES AS SHOWN BY THE ELECTRON MICROSCOPE

THEIR RELATIONSHIPS TO IMMUNITY AND CHEMOTHERAPY

II. RELATIONSHIPS TO IMMUNITY

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THE MICROBIOLOGIC SCALE OF PARASITISM

The bacteria, rickettsias, pleuropneumonia-like organisms and viruses are the smallest and simplest known forms of life. These microscopic and ultramicroscopic forms may be arranged in a scale of diminishing size and complexity of organization. This scale in general parallels a scale of diminishing metabolic independence and of increasingly obligatory parasitism. No implication is intended that such an arrangement rests on genetic relationship. No preference is implied either between the hypothesis that the viruses represent primitive forms from which more complex forms of life have evolved [76] and the alternative hypothesis that the viruses are degenerate forms which have lost in their parasitic habit the means for their own independent existence.[77] Either hypothesis can be supported, but without decisive evidence. Arrangement of these minute forms in a microbiologic scale, even if somewhat artificial, however, does afford a certain rational continuity in the consideration of their structure and organization and of their relations to immunity and chemotherapy.

Bacteria are of course the largest of these microparasites. Bacteria have a definite cellular morphology. In metabolism bacteria range from autotrophic forms to highly parasitic forms. The autotrophic forms are capable of growth on an inorganic substrate and using either sunlight or oxidation of such material as sulfur or ammonia as a source of energy; they must therefore be fully endowed with the enzymes and metabolic systems essential for the synthesis of all the components of their protoplasm.[78] This protoplasm is as complex, however, as that of other bacteria and of higher forms of life.

The parasitic forms are deficient in one or many of the synthetic mechanisms essential to their growth and therefore dependent on their hosts to supply certain growth factors. The growth factors already known to be required by one or more parasitic bacteria include most of the amino acids, purines, pyrimidines, fatty substances (e. g. oleic acid), vitamins and more complex substances (e. g. hemin and coenzyme for Hemophilus influenzae [79] and phthiacol for Johne's bacillus).[78]

In pathogenicity bacteria range from free living forms which cause disease only through accidental ingestion of their toxic metabolic products, as in the case of Clostridium botulinum, through "opportunist invaders" such as streptococci and staphylococci, to obligate parasites such as Treponema pallidum and Mycobacterium leprae, which have rarely if ever been cultivated in their virulent state outside the body. Defense against bacteria is feasible through specific active and passive antitoxic and antibacterial immune mechanisms and by means of currently available chemotherapeutic and antibiotic agents.

Rickettsias are smaller than bacteria but have essentially similar cellular morphology.[80] The pathogenic rickettsias have either lost or never achieved their metabolic independence, can be cultivated only in the presence of cells and are intracellular in their parasitic habit.[44] Specific preventive measures are in practice against rickettsial diseases but specific measures for treatment are not as yet known.[80a] Successful chemotherapy of louse borne typhus fever by para-aminobenzoic acid is also currently described.[80b]

The known viruses range in size from those of the psittacosis-lymphogranuloma group and the pock diseases, through influenza virus and the bacteriophages, down to the plant viruses, which are "macromolecules." A typical large virus, vaccinia, has been shown to have an essentially cellular morphology, with cell wall and differentiated inner protoplasm.[81] The bacteriophage particles, which are smaller than vaccinia, still have a complex morphology; they must be at or near the limit of cellular organization. The plant viruses, as far as now known, are giant molecules; the best studied of the macromolecular viruses appear to be composed solely of nucleoprotein.

The viruses are metabolically dependent on the cells within which they are obligate intracellular parasites. Specific active and passive prophylactic measures are in general very effective against virus diseases, but in general both specific immune and current chemotherapeutic measures are of very limited therapeutic value in viral diseases. Specifications for effective chemotherapeutic agents against viruses can be drawn up, however, and there are reasons for hoping that such agents may eventually be realized in practice, as will be discussed later.

THE MORPHOLOGY OF THE MICROPARASITES IN RELATION TO IMMUNITY

Bacteria and rickettsias as examined by ordinary bacteriologic methods appear to be simple and structureless. Special methods, of course, may serve to demonstrate flagella, capsules and even cell walls.[14] But the long habit of observing such minute and apparently simple objects is often reflected in methods of dealing with bacteria in practice as though they were much

Dr. Mudd was chairman of the Committee on Applications of the Electron Microscope, National Research Council, 1940-1944.

The privilege of republishing certain of the electron micrographs was extended by the authors and the journals cited in the corresponding references in the bibliography and by the Williams and Wilkins Company, Baltimore.

The first instalment of this paper, on Morphology, by Stuart Mudd, M.D., and Thomas F. Anderson, Ph.D., appeared in THE JOURNAL, October 28, p. 561. Illustrations referred to in the present paper which did not appear in the preceding instalment will appear in the reprints.

76. Boycott, A. E.: The Transition from Live to Dead: The Nature of Filtrable Viruses, Nature, London, Supplement **123**: 91-98 (Jan.) 1929.

77. Laidlaw, P. P.: Virus Diseases and Viruses: The Rede Lecture, 1938, Cambridge University Press.

78. Mueller, J. H.: Nutrition of the Single Cell: Its Applications in Medical Bacteriology, Harvey Lecture, to be published in the Harvey Lectures for 1943-1944, Series 39, Science Press, 1944.

79. Lwoff, A., and Lwoff, M.: Studies in Codehydrogenases, Proc. Roy. Soc. London, series B **122**: 352-373 (May) 1937.

80. Pinkerton,[44] Plotz, Smadel, Anderson and Chambers.[45]

80a. Successful treatment of murine typhus under rigorous experimental conditions has recently been described, however (Moragues, V.; Pinkerton, H., and Greiff, D.: Therapeutic Effectiveness of Penicillin in Experimental Murine Typhus Infection in dba Mice, J. Exper. Med. **79**: 431-437 [April] 1944). The authors write "The results would seem to justify a thorough clinical trial of penicillin in human typhus."

80b. Yeomans, Andrews, and others: The Therapeutic Effect of Para-Aminobenzoic Acid in Louse Borne Typhus Fever, J. A. M. A. **126**: 349 (Oct. 7) 1944.

simpler than they actually are. The vivid demonstration by the electron microscope of structural differentiation within the cells of bacteria, rickettsias and even the larger viruses should lead to the further development of discriminating methods of using micro-organisms as diagnostic agents and as the means for producing active and passive immunity.

Immunity Against Bacteria.—Diagnostic Reactions: Theobald Smith and Reagh [81] in 1903 demonstrated the structural and immunologic distinctness of the antigens, respectively, of the flagella and of the cell wall of Salmonella cholerae-suis. Analyses of the reactivities of the several flagellar and somatic antigens of more than a hundred intestinal pathogens of the typhoid-paratyphoid-food poisoning group are now available and are systematized in the Kauffmann-White or International schema,[82] which is the current standard for classification and etiologic diagnosis within that group. Electron micrographs of the cells and flagella of typhoid bacilli and their modification by specific immune serums are shown in figures 47 and 48.

Avery and Heidelberger [83] demonstrated the structural and immunologic distinctness of the antigens respectively of the capsules and of the cells of pneumococci. The specific capsular polysaccharides proved to be the practically important antigens of the pneumococci. The diagnostic capsular swelling phenomenon,[17] the Francis skin test and the choice of type specific therapeutic serums are all based on the specific reactivities of the respective capsular polysaccharides. Electron pictures of the capsular swelling reaction are shown in figures 23 and 24.

A more recent example of a localized bacterial component used as a diagnostic reagent, in the preparation of which insight gained with the electron microscope was used, is the agglutinogen of virulent Hemophilus pertussis, which is currently proving useful as a reagent for estimating susceptibility to whooping cough.[84] The pertussis agglutinogen was at first prepared by methods predicated on the assumption that the cells of H. pertussis should first be disintegrated to liberate the agglutinogen.[85] Later, reasoning that the agglutinogen was a component of the surface of the cells of virulent H. pertussis led to the successful attempt to extract surface material directly from the intact bacterial cells.[86] This surface extraction provided the diagnostic agglutinogen in better yield by a simpler procedure than the earlier method.

The pneumococcus capsular polysaccharide used in the Francis test and the agglutinogen of H. pertussis, phase 1, used for estimating susceptibility to pertussis, are of themselves nontoxic and give allergic skin reactions only as the result of the existence of antibodies in the skin, present in consequence of earlier infection, vaccination or serum therapy. The pneumococcus or pertussis bacterial cells, since they are of complex composition and appreciably toxic, are not equally suitable for such specific diagnostic tests. The specific somatic surface antigens of the typhoid-paratyphoid-dysentery group are, on the contrary, inherently highly toxic [87] and are thus not suitable for such specific skin tests.

The Preparation of Vaccines and Immune Serums: The virulence of a pathogenic agent may be defined as its ability to cause disease; virulence is thus defined as synonymous with pathogenicity. Virulence or pathogenicity may be considered as comprising in some instances two factors, invasiveness and toxigenicity. Invasiveness obviously means the micro-organism's capacity to penetrate and subsist within the tissues of the host. Toxigenicity for the purposes of this discussion means the capacity to elaborate an exotoxin, as exemplified by Corynebacterium diphtheriae, Clostridium tetani, Cl. botulinum, Cl. welchi, Bacterium shigae, Streptococcus pyogenes and Staphylococcus aureus. Invasiveness and toxigenicity may not always be separable in actual infection; the practical utility of considering these factors separately, however, arises from the fact that the immune mechanisms and therapeutic agents required to combat invasiveness and toxigenicity are distinct. This distinctness arises from the fact that the bacterial components against which the anti-invasive (antibacterial) and the antitoxic defensive mechanism are directed are structurally and chemically distinct.

Anti-Invasive (Antibacterial) Immunity: The ability of a pathogenic agent to establish itself on and to invade its host doubtless depends on the whole complex of relationships between parasite and host: the metabolic requirements of the pathogen in relation to the nutrition and oxygen tension provided in host tissues, the ability of the pathogen to withstand host defensive mechanisms, and so on. Specific active and passive immunity against invasiveness, however, is dependent primarily on the antigens at the surface of the pathogen. The first and essential step in the action of antibodies, whether actively or passively acquired, against the invading pathogenic agent is specific chemical combination with an antigen or antigens at the surface of the pathogenic agent. Agglutination, antibody-complement bactericidal action or phagocytosis by polymorphonuclear or mononuclear [88] phagocytes may follow as a consequence of this specific union of antibody with surface antigen, depending on the nature of the pathogen and the environing conditions. The antigens of the cell wall of the pathogenic agent in its virulent form are therefore the primary requisite of any diagnostic reagent or vaccine which is to detect or stimulate anti-invasive immunity. Since electron microscopy shows that the cell walls of bacteria and rickettsias form a relatively small fraction of the mass of the cells and since the inner protoplasm may be toxic, these facts have practical implications. It is perhaps not too rash to predict that purified surface antigens will increasingly come into use as diagnostic reagents and even as vaccines for active immunization.

81. Smith, Theobald, and Reagh, A. L.: The Nonidentity of Agglutinins Acting on the Flagella and on the Body of Bacteria, J. M. Res. **10:** 89-100 (Aug.) 1903.

82. Bornstein, S.: The State of the Salmonella Problem, J. Immunol. **46:** 439-496 (June) 1943.

83. Heidelberger, M., and Avery, O. T.: The Soluble Specific Substance of Pneumococcus, J. Exper. Med. **38:** 73-79 (July) 1923. Avery, O. T., and Heidelberger, M.: Immunological Relationships of Cell Constituents of Pneumococcus, ibid. **38:** 81-85 (July) 1923.

84. Flosdorf, E. W.; Felton, H. M.; Bondi, A., and McGuinness, A .C.: Intradermal Test for Susceptibility To and Immunization Against Whooping Cough Using Agglutinogen from Phase I H. Pertussis, Am. J. M. Sc. **206:** 421-425 (Oct.) 1943. Felton, H. M., and Flosdorf, E. W.: Clinical Results with the Use of Agglutinogen from Phase I Hemophilus Pertussis as a Skin Test for Susceptibility to Whooping Cough, J. Pediat. **22:** 259-264 (March) 1943.

85. Flosdorf, E. W., and Kimball, A. C.: Comparison of Various Physical Means of Liberation of the Agglutinogen from H. Pertussis in Phase I, J. Immunol. **39:** 287-295 (Oct.) 1940.

86. Smolens, J., and Mudd, S.: Agglutinogen of Hemophilus Pertussis Phase I for Skin Testing: Theoretical Considerations and a Simple Method of Preparation, J. Immunol. **47:** 155-163 (Aug.) 1943.

87. Weil, A. J.: Progress in the Study of Bacillary Dysentery, ibid. **46:** 13-46 (Jan.) 1943. Morgan, W. T. J., and Partridge, S. M.: An Examination of the O Antigenic Complex of Bact. Typhosum, Brit. J. Exper. Path. **23:** 151-165 (Aug.) 1942. Perlman, E.; Binkley, F., and Goebel, W.: Immunochemical Studies on Shigella Paradysenteriae, J. Bact. **47:** 476 (May) 1944; abstract.

88. Mudd, S.; McCutcheon, M., and Lucké, B.: Phagocytosis, Physiol. Rev. **14:** 210-275 (April) 1934.

The pneumococcus polysaccharide used in the Francis skin test in pneumonia and the agglutinogen of Hemophilus pertussis used in the diagnosis of susceptibility to pertussis have already been cited as examples of the use of specific surface components for susceptibility tests.

Type specific serologic reactivity, on which specific antibacterial immunity depends, may be determined by configuration either of a carbohydrate or of a protein component. The capsular polysaccharides of the various pneumococcus types are the classic examples of carbohydrate antigens which determine type. The surface somatic proteins ("M substance") of the various types of Streptococcus pyogenes are an example of type determination by protein antigens. In the case of the typhoid-paratyphoid-dysentery group, type specificity is determined by a phosphorus-containing polysaccharide-protein complex in which the carbohydrate component is type specific and the protein component is not type specific.[82] The characteristic antigenic reactivity (and toxicity) of the somatic antigens of this group appear, however, to be a property of the intact phosphorus-containing polysaccharide-protein complex and not of either the isolated carbohydrate or protein component alone.[87] In all cases known to me, however, the reactive configurations which determine type specificity and antibacterial immunity are peripheral,[89] i. e. are in the capsule, as in pneumococci, in the bacterial cell wall, as in Streptococcus pyogenes and the Shigellas, or in the bacterial cell wall and flagella, as in Eberthella typhosa and the Salmonellas.

Emphasis on the selection of pathogens in fully virulent form as a source of antigens for detecting or producing anti-invasive immunity perhaps requires further elaboration. Evidence is slowly accumulating from many sources to indicate that the specific, pathogenic types of bacteria represent highly differentiated phases which are characteristically found under conditions of active and successful parasitism. These specific differentiated phases may, under favorable conditions, persist in culture. Usually, however, type specificity and pathogenicity tend sooner or later to diminish or be lost under artificial cultivation. Loss of type specificity usually proceeds *pari passu* with loss of an antigenic component at the surface of the parasite, for instance of the capsular polysaccharides of virulent pneumococci, the Vi somatic polysaccharide of virulent E. typhosa, the M protein present in the cell wall of virulent Str. pyogenes[25] or the agglutinogen of Hemophilus pertussis in phase I;[90] loss of type specific surface antigen is usually correlated also with loss of invasiveness. Such nonpathogenic phases, which have lost the surface antigens associated with virulence, are obviously unsuited as immunizing agents to protect against invasion.

The ability to elaborate exotoxin (toxigenicity), on the other hand, may persist without relation to loss of type specific surface antigens and of the component of virulence on which depends the ability of the parasite to establish itself on and to invade its host.

Antitoxic Immunity: The diseases which are primarily due to the production of exotoxin are those in which specific biologic prophylaxis and treatment have had their most conspicuous successes. Diphtheria, tetanus and to a less extent scarlet fever are cases in point. The exotoxin elaborated by the growing pathogenic agent passes out of the bacterial cell into the culture medium or host tissue and exerts its toxic action at a distance from its source. In diphtheria and tetanus early neutralization of the exotoxin by specific antitoxin usually suffices to permit recovery, the defensive mechanisms of the host in due course serving to eliminate the parasites themselves. In streptococcic and staphylococcic infection neutralization of the exotoxins does not of itself necessarily suffice to prevent tissue invasion by the streptococci or staphylococci themselves.

Exotoxin is ordinarily harvested from aged cultures in which many or most of the bacterial cells are cytolyzed. Morton and Gonzalez,[91] however, obtained diphtheria toxin from young cultures of C. diphtheriae by sonic disintegration of the bacterial cells. The exact site of formation of toxin by the bacterial cells is not known. Only one type of toxin is known to be produced by C. diphtheriae or by Cl. tetani, although the cells of the diphtheria or tetanus bacilli occur in several agglutinative types.

Since exotoxins and toxoids as ordinarily dealt with are free from the cells which produced them, and since their relation to the architecture of these cells is unknown, their further discussion would be outside the scope of the present article.

Immunity Against Viruses.—The immune mechanisms which are operative against bacteria and other foreign particles containing antigens are also operative against viruses.[92] Specific combination of viral antigen and corresponding antibody can be demonstrated in vitro by precipitation, agglutination or complement fixation, and in vivo by specific neutralization of virus infectivity. The combination of virus and specific antibody has been demonstrated in electron pictures by Anderson and Stanley[93] (figs. 49 and 50). The blood clearing mechanism, consisting of the fixed reticuloendothelial macrophages, the wandering macrophages, the circulating monocytes and polymorphonuclear leukocytes, acting in coordination with antibodies, is operative against viruses. Virus neutralizing antibodies are extremely effective in protecting animals against experimental virus infections. Clinical protection following exposure to various virus diseases may be afforded under appropriate conditions by convalescent human serums. Active immunization or recovery affords some degree of protection against most or all virus diseases. In brief, the classic phenomena of active and passive immunity and allergy are exhibited with respect to viral and rickettsial infections, but with modifications consequent on the obligate intracellular sites of the infecting viruses and rickettsias.

Active and passive humoral immunity (i. e. immunity dependent on antibodies) is of more conspicuous value in diseases due to intracellular parasites if established prior to the onset of clinical symptoms than for the treatment of established infection. The commonly

89. By "peripheral" is meant present in the periphery of the cell, without implication, however, that the component may not be present also in the inner protoplasm of the bacterial cell. It may be emphasized also that antigens of bacterial flagella may be of cardinal importance for diagnostic purposes but have only a very minor role in antibacterial immunity.

90. Flosdorf, E. W.; Dozois, T. F., and Kimball, A. C.: Studies with H. Pertussis: V. Agglutinogenic Relationships of the Phases, J. Bact. **41**: 457-471 (April) 1941. Flosdorf, E. W., and McGuinness, A. C.: Studies with Hemophilus Pertussis: VIII. The Antigenic Structure of Hemophilus Pertussis and Its Clinical Significance, Am. J. Dis. Child. **64**: 43-50 (July) 1942.

91. Morton, H. E., and Gonzalez, L. M.: On the Site of Formation of Diphtherial Toxin, J. Immunol. **45**: 63-68 (Sept.) 1942.

92. Extensive data on this point are summarized by Topley, W. W. C., and Wilson, G. S.: Principles of Bacteriology and Immunology, ed. 2, London, 1936, chapter 52.

93. Anderson, T. F., and Stanley, W. M.: A Study by Means of the Electron Microscope of the Reaction Between Tobacco Mosaic Virus and Its Antiserum, J. Biol. Chem. **139**: 339-344 (May) 1941.

accepted explanation is that once intracellular parasites (chiefly the rickettsias and viruses) have parasitized their host cells they are no longer accessible to the action of immune serum. This pessimism regarding specific therapy would doubtless be justified if all the susceptible cells which are ultimately affected were parasitized at the same time. However, in a recent article on this subject Stokes [94] offers evidence that measles may be modified to some extent if sufficient human antibodies are administered in its earliest febrile stage. Topping [95] presents similar data for experimental animal and for clinical human cases of Rocky Mountain spotted fever. Stokes emphasizes the importance of earlier diagnosis of such diseases so that the therapeutic as well as prophylactic possibilities of such newly available preparations as Cohn's human γ-globulin concentrate may be realized.

Another phenomenon of acquired resistance has most recently been proved to exist in a number of viral infections. This phenomenon of acquired cellular resistance is quite outside the classic phenomena of immunity as described in infections caused by extracellular parasites. Whether or not this phenomenon may ultimately prove to be coextensive with intracellular parasitism and what its practical implications may be it is as yet too early to predict. Its possible importance as well as its relative unfamiliarity suggest discussion of the interference phenomenon or the phenomenon of acquired cellular resistance in considerable detail.

The Interference Phenomenon in Viral Diseases; Acquired Cellular Resistance.—A growing body of evidence shows the existence in viral diseases of a phenomenon involving a specific relationship between viruses and host cells, and specific interference between related viruses in the parasitizing of their host cells. The challenging question of the extent to which this phenomenon may be related to active resistance to superinfection during infectious diseases due to intracellular parasites, in carrier states and following recovery from such diseases is worthy of much consideration.

The most clearcut instances of the interference phenomenon consist in the protection, within strict limits of time, dosage and other factors, of host cells ordinarily susceptible to a virulent virus by the presence of a related [96] virus. The protection may be afforded by a virus of such low virulence with respect to the host cells in question that minimal or even no symptoms are observable; the protective action may be initiated by the related virus prior to or simultaneously with infection with the virulent virus. This phenomenon of interference between related viruses has been described with respect to animal, plant and bacterial (bacteriophage) viruses.

Interference Between Animal Viruses: Magrassi [97] first observed in Doerr's laboratory in 1935 a phenomenon of immunity against superinfection which was not satisfactorily explicable in terms of humoral immunity. Magrassi worked with strains of herpes virus, certain of which were capable and certain incapable of causing encephalitis in rabbits. Following corneal infection with a nonencephalitogenic strain the rabbits did not develop any clinical signs of encephalitis; nevertheless the virus could be demonstrated to be present in the brain on the sixth day following intracorneal inoculation; from the fourth day after corneal inoculation the animal was immune to direct cerebral inoculation even of large doses of encephalitogenic virus. Magrassi similarly demonstrated that, from five to ten days after intracutaneous inoculation of herpes virus, rabbits were immune to cerebral reinoculation with the virus; the reinoculated virus indeed disappeared rapidly from the brain, and this disappearance was not explicable as a neutralization by antibodies. Magrassi's essential observations were confirmed by Doerr and Seidenberg,[98] and the significance of these and similar experiments were discussed by Doerr and Kon.[99]

Hoskins [100] in 1935 observed that Macacus rhesus monkeys injected subcutaneously or intraperitoneally with mixed pantropic and neurotropic strains of yellow fever virus were protected by the neurotropic strain from fatal infection by the pantropic strain. The same protective effect against pantropic virus was afforded if the neurotropic strain was injected separately up to twenty hours after the pantropic strain; if injection of the pantropic virus preceded injection of the neurotropic strain by forty-eight hours, however, there was no protection and the animals died of infection with the pantropic strain.

These observations were confirmed and extended by Findlay and MacCallum.[101] Protection against pantropic yellow fever virus was afforded by concurrent injection of neurotropic yellow fever virus in several host species. Rift Valley fever virus also afforded some protection to monkeys against pantropic yellow fever virus. Neurotropic yellow fever virus in turn protected mice against Rift Valley fever virus. The authors offered as a possible explanation of these instances of interference of one virus with the pathogenic action of another virus the hypothesis "that when certain cells are already occupied by actively multiplying virus particles they cannot be invaded by certain other virus particles."

Jungeblut and Sanders [102] similarly demonstrated interference between a mouse adapted and a monkey strain of poliomyelitis virus. The presence of murine virus in the monkey brain was shown to interfere critically with the propagation of virulent monkey strains in the same animal. This effect could be produced therapeutically up to four days after intracerebral inoculation of the virulent virus. Thus "among a total of 88 monkeys which had received murine virus between the first and fifth day of the disease, 51 monkeys, or more than half (57 per cent), failed to show paralytic symptoms, while in a group of 50 untreated controls

94. Stokes, J., Jr.: The Use of Immune Bodies in the Treatment of Certain Infectious Diseases (Virus and Rickettsial Diseases) Caused by Intracellular Parasites, with Emphasis on the Need for Early Diagnostic Criteria of Infection. Yale J. Biol. & Med. **16**: 415-424 (May) 1944.

95. Topping, H. H.: Rocky Mountain Spotted Fever: Further Experience in the Therapeutic Use of Immune Rabbit Serum, Pub. Health Rep. **58**: 757-775 (May 14) 1943.

96. The term "related" is used without for the present attempting precise definition. In many but definitely not in all cases in which data are available, interfering strains are serologically cross reactive. Probably all that should be implied at this time is that interfering viruses parasitize the same host cells in some competitive manner.

97. Magrassi, F.: Studii sull' infezione e sull' immunita da virus erpetico, Ztschr. f. Hyg. u. Infektionskr. **117**: 501-528 (Nov.), 573-620 (Dec.) 1935.

98. Doerr, R., and Seidenberg, S.: Die Konkurrenz von Virus-infektionen im Zentralnervensystem (Phänomen von Fl. Magrassi), Ztschr. f. Hyg. u. Infektionskr. **119**: 135-165 (Jan.) 1937.

99. Doerr, R., and Kon, M.: Schieneninfektionen, Schienenimmunisierung und Konkurrenz der Infektionen im Z. N. S. beim Herpesvirus, Ztschr. f. Hyg. u. Infektionskr. **119**: 679-705 (July) 1937.

100. Hoskins, M.: A Protective Action of Neurotropic Against Viscerotropic Yellow Fever Virus in Macacus Rhesus, Am. J. Trop. Med. **15**: 675-680 (Nov.) 1935.

101. Findlay, G. M., and MacCallum, F. O.: An Interference Phenomenon in Relation to Yellow Fever and Other Viruses, J. Path. & Bact. **44**: 405-424 (March) 1937.

102. Jungeblut, C. W., and Sanders, M.: Studies of a Murine Strain of Poliomyelitis Virus in Cotton Rats and White Mice, J. Exper. Med. **72**: 407-436 (Oct.) 1940; Studies in Rodent Poliomyelitis: V. Interference Between Murine and Monkey Poliomyelitis Virus, ibid. **76**: 127-142 (Aug.) 1942.

only 2 monkeys (4 per cent) escaped the disease." In seeking an explanation the authors point out that both murine and monkey strains of the virus "possess the same affinity for the anterior horn cell which constitutes the selective seat of the poliomyelitic lesion. . . . A 'blockade' of susceptible cells by nonparalyzing murine virus might render these cells temporarily impregnable to an attack of paralyzing monkey virus because the orderly function of certain enzyme systems, necessary for successful propagation of monkey virus, has conceivably been disturbed by previous contact with murine virus."

Protection of hamsters against a hamster adapted strain of poliomyelitis virus by previous inoculation with various other strains of poliomyelitis virus has recently been described by Dalldorf and Whitney:[103] "The protection is well developed within six days and persists for from six to eight weeks." As in other instances, heat inactivated virus does not afford this protection; . . . "the time relationships are important in showing that the phenomenon is an interference rather than cross immunity."

Reciprocal interference between strains of influenza virus grown in tissue cultures has been demonstrated by Andrewes:[104]

> When a strain of influenza A is given good opportunity to multiply in a tissue culture of the Maitland type, that culture is thereby rendered incapable of supporting the growth of another strain of influenza added subsequently. This cannot be because of any formation of antibody, nor is there any change in p_H as compared with uninoculated cultures.

The cells of the infected culture would still support growth of the unrelated virus of lymphogranuloma venereum. "When two strains of influenza A virus were added to a tissue culture simultaneously but in widely differing amounts, the one present in larger quantity suppressed the growth of the other."

The Henles,[105] studying the propagation of influenza A virus in the chorioallantoic membrane of embryonated eggs, have demonstrated interference by homologous virus partially inactivated by aging or by ultraviolet irradiation:

> Similar interference experiments conducted in mice by the intranasal injection of partially inactivated virus preparations, followed five hours later by the active agent, have given results indicating that the same phenomenon may be demonstrated in this species. Protection against as much as 250 50 per cent mortality doses was noted.

Interrelationships between classic immunity and the phenomenon of acquired cellular resistance are well brought out by the studies of Morgan and Olitsky,[106] Morgan, Schlesinger and Olitsky[107] and Schlesinger, Olitsky and Morgan.[108] A degree of active immunity can be induced in animals by vaccination with formaldehyde inactivated eastern equine encephalomyelitis virus or western equine encephalomyelitis virus. In such vaccinated animals the degree of resistance to intracerebral inoculation of homologous virus is correlated with the titer of neutralizing antibody in the serum and with the neutralizing capacity of the cerebrospinal fluid.[107] Animals vaccinated with formaldehyde inactivated eastern equine encephalomyelitis virus are not immunized against western equine encephalomyelitis virus, nor are those vaccinated with western equine encephalomyelitis virus immune to eastern equine encephalomyelitis. This is the familiar picture of specific active immunity.

If now such vaccinated guinea pigs were injected intracerebrally with 1 to 1,000 minimum lethal dose of homologous virus a steep rise in temperature occurred, first observed two hours after inoculation and persisting for about twenty-four hours; while in control animals fever lasted until prostration or death, in immune animals the temperature dropped after twenty-four to thirty hours and remained normal thereafter.[108] Guinea pigs two weeks after this abortive infection with western equine encephalomyelitis virus resisted intracerebral reinoculation with 10 or 1,000 minimum lethal doses of eastern equine encephalomyelitis virus. Similar observations were made in rabbits. Animals thus rendered resistant to reinoculation intracerebrally with either homologous or heterologous virus were not resistant to peripheral reinoculation with heterologous virus, which circulated in the blood stream as in normal animals. Animals vaccinated and then recovered from an abortive infection with western equine encephalomyelitis exhibited also an increased resistance to intracerebral inoculation with Theiler's virus. This, then, is the picture of the interference phenomenon—an induced, transient resistance to superinfection of cells which would normally be susceptible, this acquired cellular resistance not being necessarily limited to serologically cross reactive types of intracellular parasite.

The interference phenomenon has recently been investigated in detail by Ziegler and Horsfall,[109] Ziegler, Lavin and Horsfall[110] and the Henles,[111] using embryonated hen's eggs inoculated into the allantoic sac with influenza virus. Reciprocal interference has been clearly demonstrated between strains of influenza A, influenza B and swine influenza virus. These strains are related in their tropism for tissue but are not serologically cross reactive. Suppression of reproduction of active virus was obtained by the presence of active heterologous virus or of homologous or heterologous virus rendered partially or completely noninfective by carefully quantitated ultraviolet radiation or by prolonged storage at low temperature. Reproduction of active virus could be suppressed by introduction of noninfective virus as long as twelve hours after inoculation of the active virus.

103. Dalldorf, G., and Whitney, E.: A Further Interference in Experimental Poliomyelitis, Science **98**: 477-478 (Nov. 26) 1943.

104. Andrewes, C. H.: Interference by One Virus with the Growth of Another in Tissue Culture, Brit. J. Exper. Path. **23**: 214-220 (Aug.) 1942.

105. Henle, W., and Henle, G.: Interference of Inactive Virus with the Propagation of Virus of Influenza, Science **98**: 87-89 (July 23) 1943.

106. Morgan, I. M., and Olitsky, P. K.: Immune Response of Mice to Active Virus and to Formalin-Inactivated Virus of Eastern Equine Encephalomyelitis, J. Immunol. **42**: 445-454 (Dec.) 1941.

107. Morgan, I. M.; Schlesinger, R. W., and Olitsky, P. K.: Induced Resistance of the Central Nervous System to Experimental Infection with Equine Encephalomyelitis Virus: I. Neutralizing Antibody in the Central Nervous System in Relation to Cerebral Resistance, J. Exper. Med. **76**: 357-369 (Oct.) 1942.

108. Schlesinger, R. W.; Olitsky, P. K., and Morgan, I. M.: Observations on Acquired Cellular Resistance to Equine Encephalomyelitis Virus, Proc. Soc. Exper. Biol. & Med. **54**: 272-273 (Dec.) 1943.

109. Ziegler, J. E., Jr., and Horsfall, F. L.: Interference Between the Influenza Viruses: I. The Effect of Active Virus on the Multiplication of Influenza Viruses in the Chick Embryo, J. Exper. Med. **79**: 361-377 (April) 1944.

110. Ziegler, J. E., Jr.; Lavin, G. I., and Horsfall, F. L.: Interference Between the Influenza Viruses: II. The Effect of Virus Rendered Noninfective by Ultraviolet Radiation on the Multiplication of Influenza Viruses in the Chick Embryo, J. Exper. Med. **79**: 379-400 (April) 1944.

111. Henle, W., and Henle, G.: Interference Between Inactive and Active Viruses of Influenza: I. The Incidental Occurrence and Artificial Induction of the Phenomenon, Am. J. M. Sc. **207**: 705-716 (June) 1944; Interference Between Inactive and Active Viruses of Influenza: II. Factors Influencing the Phenomenon, ibid. **207**: 717-732 (June) 1944.

Interference Between Plant Viruses.—The literature on acquired immunity of plants to viral diseases has been reviewed by Price.[112] Many plants recover symptomatically from virus disease but remain carriers of viable virus. Such plants are immune to reinoculation of the same or related viruses but not to unrelated viruses:

> Plants recover after an acute attack by production of shoots or leaves which appear healthy or show only mild symptoms of disease, which still harbor virus and which are refractory to infection with the virus in question but not to infection with unrelated viruses.
>
> With respect to cross immunity, it has been shown with numerous groups of viruses that plant tissues invaded by one strain of a virus are protected from infection with another strain of the virus but are susceptible to infection with unrelated viruses. The immunity appears to be closely associated with presence of virus in the immune tissues, since there is no evidence that virus free tissues of infected plants are immune. The cross immunity reaction has proved useful for differentiation and classification of plant viruses.

Kunkel [113] records an instance in which this interference between plant viruses was of curative value during the first days of infection. A mild strain of tobacco mosaic virus was used to immunize tomato plants against a lethal strain of tobacco mosaic virus which quickly kills unprotected tomato plants. The tomato plants were saved from death or serious injury when they were inoculated with the mild virus within three days after infection.

It is to be emphasized that nothing equivalent to antibodies and therefore no natural humoral mechanism of immunity has been demonstrated in plants. It is true that specific neutralization of the infectivity of plant viruses by immune serums prepared in animals can be demonstrated experimentally; this, however, is definitely an artificial procedure. Price presents interesting considerations suggesting that the type of specific acquired immunity under discussion may be common to animals and plants alike.

Interference Between Bacterial Viruses (Bacteriophages).—The lysis of bacteria by bacteriophage may be considered as a virus infection in which the susceptible bacterial cell is the host and the bacterial virus or bacteriophage particle is the parasite. The accessibility of the bacterial cell to observation, the simplicity of the host (simplicity at least as compared to animal and plant hosts) and the short time within which the parasitic cycle is complete make bacteriophage lysis peculiarly suitable for definitive analysis.

Interference between types of bacteriophage active against a single strain of E. coli has been demonstrated and analyzed by Delbrück and Luria,[114] Luria and Delbrück [115] and Luria, Delbrück and Anderson.[42] Two different types of bacteriophage, α and γ, each independently produce characteristic lysis of the susceptible strain of colon bacilli. In mixed infection under suitable conditions, however, lysis is exclusively of the γ type, and lysis by α phage is completely suppressed.

Analysis of lysis by these bacteriophage strains reveals that the first step is adsorption of bacteriophage particle or particles on the surface of the bacterial cell. Unless phage is present in great excess there is no interference between the two phage strains in regard to this primary adsorption; each strain is adsorbed at a rate dependent on its own affinity for the host cell and the experimental conditions.

"The second phase of the life cycle is the multiplication of the virus in the cell. After the bacterial cell has adsorbed a virus particle, it retains normal appearance for a while; then, suddenly, the newly formed virus particles are liberated. In most cases the cell is lysed at the same moment. . . . After this the newly liberated virus particles will become adsorbed to other bacteria still present in the culture." In infection by a mixture of the two phage strains the chain of events between adsorption of virus on cell, through multiplication of the virus, to liberation of new phage particles is dominated by the γ phage. In lysis by the γ phage the latent period between adsorption and liberation of the new phage particles is twenty-one to twenty-five minutes and on the average about 135 new phage particles are released from each cell lysed. These characteristic constants are not altered by the presence in the mixed infection of α phage particles, and the new phage particles produced are exclusively of the γ type. The α phage alone produces lysis in thirteen to seventeen minutes. Yet the suppression of the growth of α phage may be brought about even when γ phage is added several minutes after infection by α phage.

Luria and Delbrück [115] found that the ability of γ phage to suppress the growth of α phage could be demonstrated even after the γ bacteriophage was partially inactivated by ultraviolet radiation, although heat inactivated phage had lost this ability. Analysis of the quantitative data led to the conclusion that the adsorption of one ultraviolet inactivated γ particle on the bacterial cell was sufficient to inhibit the growth of virus α:

> The ultraviolet inactivated virus γ also shows the capacity of inhibiting the growth of the sensitive bacteria. These are not lysed but deprived of the ability to divide. The number of bacterial cells thus affected corresponds to that of the cells in which the growth of the virus α is inhibited; the two actions evidently are manifestations of the same phenomenon. The suppression of bacterial growth must be due to inhibition by virus γ of some fundamental step in the synthetic processes of the bacterial life cycle.

A bacterium-phage relationship suggestive of the resistant carrier state which is so familiar in animal and plant pathologic conditions has been described by Burnet and Lush: [116]

> A bacteriophage (C) acting on the nonpathogenic white coccus SF is characterized by the unusual frequency with which it provokes the appearance of resistant forms. Each plaque shows a central growth of resistant culture, and suitable experiments indicate that under the usual conditions of growth 10 or 20 per cent of effective contacts between phage and susceptible bacterium result in the appearance of resistant lysogenic variants, the remainder initiating lysis in classic fashion. The resistant culture shows no gross evidence of lytic action on agar but in broth culture liberates considerable amounts of phage.

112. Price, W. C.: Acquired Immunity from Plant Virus Diseases, Quart. Rev. Biol. **15**: 338-361 (Sept.) 1940.

113. Kunkel, L. O.: New Views in Virus Disease Research, chapter IV in Science in Progress, New Haven, Yale University Press, 1939, pp. 118-121.

114. Delbrück, M., and Luria, S. E.: Interference Between Bacterial Viruses: I. Interference Between Two Bacterial Viruses Acting on the Same Host, and the Mechanism of Virus Growth, Arch. Biochem. **1**: 111-141 (Oct.) 1942.

115. Luria, S. E., and Delbrück, M.: Interference Between Inactivated Bacterial Virus and Active Virus of the Same Strain and of a Different Strain, Arch. Biochem. **1**: 207-218 (Dec.) 1942.

116. Burnet, F. M., and Lush, D.: Induced Lysogenicity and Mutation of Bacteriophage Within Lysogenic Bacteria, Australian J. Exper. Biol. & M. Sc. **14**: 27-38 (March) 1936.

Concerning the change of the host bacterial cell from normal susceptible to resistant carrier the authors say:

The production of the resistant lysogenic strain SF/C provides a clearcut example of the positive induction of change in bacterial character by the action of a bacteriophage. In this instance the alternative of selection by phage from preexistent variants in the population submitted to lysis is definitely excluded. The rapidity with which the change is induced is noteworthy. Within an hour of contact with phage C the surface of the bacterium has changed so that it no longer adsorbs either phage C or C′ and becomes insusceptible to their action. This changed character is then transmitted indefinitely to its descendants. It is not possible to say whether this surface change results from an altered genetic constitution of the bacterium or is directly induced by the associated phage at each generation.

White [117] discovered a similar case in cholera bacteriophagy. A phage strain of small lytic power "renders the originally sensitive vibrio forthwith and in perpetuity resistant to the most active" phage strain. The resistant bacteria are lysogenic, i. e. are carriers of phage. Concerning mechanism, White writes "The obvious and highly probable explanation is that the less lytic phage, lacking nothing in combining vigor, establishes itself on the 'phage receptors' of the bacterium, forbidding entry to its more destructive confrère. . . ."

These data on the interference phenomenon in animals, plants and bacteria have been presented in what may seem disproportionate detail because of my belief that they may lead to the threshold of a more fundamental understanding of the relationship of the parasite to the parasitized host cell in many diseases caused by intracellular parasitic agents. They may be considered relevant to a discussion of the morphology of microparasites because a critical relationship between components of the parasites and components of the parasitized host cells is involved. In some instances at least the first step of this critical relationship, the adsorption of virus to host cell, may be shown to depend on a specific correspondence in chemical configuration between the virus and components of the host cell surface analogous to that between antibody and cell surface antigen.

The first step in the action of bacteriophage particle on susceptible bacterial cell is specific adsorption of the phage particle to the surface of the bacterial cell. This adsorption must depend on a lock to key correspondence between the pattern of certain molecular configurations on the surface of the bacterial cell and the pattern of configurations on the surface of the phage particle.[118] The adsorption of phage to a specific receptor site on the bacterial cell is analogous to the combination of antibody with antigen at the surface of the bacterial cell. Each depends on a specific surface configurational correspondence.

The specificity of the phage receptor and the antigen sites may be closely similar. Thus Schiff and Bornstein [119] describe a phage specific for the somatic antigen IX of the Kauffmann-White table of Salmonella antigens. This antigenic configuration occurs in Eberthella typhosa and in group D of the Salmonellas; bacterial species whose surface contains configuration IX are with few exceptions susceptible to this particular phage and species lacking IX are not, again with certain exceptions. Another phage lyses bacterial species containing the flagellar antigen *d* which occurs in E. typhosa and in certain Salmonella species. A similar phage for R somatic antigen is described by the same authors.[119] On the other hand the Vi phages described by Craigie and Brandon [120] and Craigie and Yen [121] have permitted the subdivision of the single serologic V type of E. typhosa into eighteen types and subtypes [121] as determined by phage susceptibility. Finally within the species Streptococcus pyogenes [122] the specificity of serologic types is narrower than that of the grouping determined by phage susceptibility. Strains of dysentery bacteriophage are available also which lyse strains of several types within the species Shigella paradysenteriae. The sites on the bacterial cell with which phages combine may thus be more or less specific or equally specific with the sites at which given antibodies combine. In each case the combination must be critically dependent on molecular configurations in the bacterial cell surface.

Direct evidence that the combination between bacteriophage and susceptible cell is also dependent on the state of the surface of the bacteriophage particle is afforded by the recent study of Kalmanson and Bronfenbrenner.[123] These investigators have shown that adsorption of phage particle to bacterial cell can be prevented by previous combination of phage with antiphage serum and that the phage activity can be quantitatively restored by digesting away the antibody coating with the proteolytic enzyme papain. The phage particle coated with antiphage serum cannot combine with the bacterial cell receptors; removal of the antibody from the phage particle surface enables it to combine with and cause lysis of its bacterial host cell.

The chain of events following adsorption of phage particle to susceptible cell surface leads to multiplication of the phage and usually to lysis of the bacterial host cell. d'Herelle [124] presents evidence suggesting that the phage may elaborate lysins which are distinct from the components which determine adsorption to the susceptible cell. However, the mechanism of phage multiplication [125] and of bacterial lysis have not yet been clearly analyzed and will not be considered further in this report.

In the work cited a beginning has been made in discovering the all important events that are involved in the parasitization of a host cell by an intracellular parasite. In the case of bacteriophagy at least it seems clear that the initial event is a specific adsorption of the phage particle to bacterial host cell, this combination,

117. White, P. B.: Lysogenic Strains of V. Cholerae and the Influence of Lysozyme on Cholera Phage Activity, J. Path. & Bact. **44**: 276-278 (Jan.) 1937.

118. This sentence is obviously an interpretation by the author, to whom, however, the conclusion seems almost a rational necessity. Experimentally it rests on the analogy between the specificities of the phage-bacterial cell and the antibody-bacterial cell relationships. That the antibody-antigen combination depends on specific surface configurational correspondence is documented by a large and detailed body of knowledge.

119. Schiff, F., and Bornstein, S.: Hemolytic Effect of Typhoid Cultures in Combination with Pure Lines of Bacteriophage, J. Immunol. **39**: 361-367 (Oct.) 1940.

120. Craigie, J., and Brandon, K. F.: Bacteriophage Specific for the O Resistant V Form of B. Typhosus, J. Path. & Bact. **43**: 233-248 (Sept.) 1936.

121. Craigie, J., and Yen, C. H.: The Demonstration of Types of B. Typhosus by Means of Preparations of Type II Vi Phage, Canad. Pub. Health J. **29**: 448-463 (Sept.) 1938.

122. Evans, A.: Studies in Hemolytic Streptococci: II. Streptococcus Pyogenes, J. Bact. **31**: 611-624 (June) 1936.

123. Kalmanson, G. M., and Bronfenbrenner, J.: Restoration of Activity of Neutralized Biologic Agents by Removal of the Antibody with Papain, J. Immunol. **47**: 387-407 (Nov.) 1943.

124. d'Herelle, F.: Phénomène de la guérison dans les maladies infectieuses, Paris, 1938.

125. A beginning of analysis of phage multiplication has been made by T. F. Anderson: Virus Reactions Inside of Bacterial Host Cells, J. Bact. **47**: 113 (Jan.) 1944; abstract.

like that between antigen and antibody, being determined by specific configurational relationships. This adsorption of phage particle is followed by profound alterations in the metabolic events which occur within the parasitized cell. Some at least of the consequences have been detected: 1. The host cell may become altered in such a way as to make it refractory to superinfection with similar or competing virus particles (acquired cellular resistance—the interference phenomenon). 2. Multiplication of the bacterial host cell may be arrested. 3. Multiplication of the virus within the host cell may occur without lysis (lysogenic strains). 4. Multiplication of the virus within the host cell followed by lysis may occur.

To what extent may the relationship of bacteriophage particles to their bacterial host cells be regarded as affording a clue to the relationship of virus particles to susceptible cells of higher animals and plants? Obviously this question can now be answered in only the most tentative way. The analogies between the phenomena of acquired cellular resistance (interference phenomenon) as exhibited in viral infections of animals and plants and of bacteria seem to me very suggestive, indeed. Particularly suggestive too is the recent study by Hirst [126] of the adsorption of influenza virus on cells of the respiratory tract.[127] The analogies between the protective action of serum in prophylactic passive immunization (e. g. against measles) and the reversible inactivation of phage by immune serum [128] is suggestive.

Although the phenomenon of acquired cellular resistance to superinfection would appear to be a consequence of the fundamental mechanisms of reproduction within their host cells of many animal, plant and bacterial viruses, interference does not occur in all instances of viral infection. Thus numerous cases are on record of the infection of individual cells by more than one virus,[128] evidenced by the demonstration, for instance, of specific intranuclear and cytoplasmic inclusion bodies within the same cell. The changes consequent on the parasitization of a cell, in some but not all instances, therefore render that cell refractory to a second intracellular parasite. Although this acquired cellular resistance is a phenomenon separate from humoral immunity, the two phenomena may supplement each other in the total defense against an intracellular parasitic disease.

Is the phenomenon of acquired cellular resistance limited to viral infections? Diseases due to rickettsias have not as yet been investigated with reference to the existence or nonexistence of the interference phenomenon, as far as I am aware; observations which may be interpreted as suggestive of the possible occurrence of such a phenomenon in rickettsial diseases are recorded in Pinkerton's review.[44]

Phases in which bacterial pathogens survive and even multiply within host cells are not unknown in diseases of bacterial causation, e. g. leprosy and the early stages of tuberculosis. In tuberculosis the physiologic behavior and even the morphology of mononuclear phagocytic cells is altered by ingestion of tubercle bacilli and their products, as well shown in the thorough investigations of Lurie.[129] Such cells may acquire an increased metabolic activity, as evidenced by increased rate of division and increased rate of phagocytosis, and an increased capacity to destroy tubercle bacilli. Comparison of this altered physiologic behavior with the phenomenon of acquired cellular resistance to intracellular parisitization would be purely speculative at this time, however.

SUMMARY

Electron micrographs of the simplest parasitic agents of disease have afforded new insight into their structure. Bacteria and rickettsias are shown to have a simple cellular organization. The continuity of bacterial groupings, the shape and structural integrity of the individual bacterial cell are dependent on a well defined bacterial cell wall. This cell wall is in the solid state and may maintain its essential form even after injury to the bacterial cell. Within the cell wall is the bacterial protoplasm with its limiting protoplasmic membrane; only the protoplasm and protoplasmic membrane are seen in ordinary microscopic preparations. The protoplasm is either a sol or a gel which may be readily solvated; it may contain more or less well defined areas of greater density. Certain animal viruses and bacterial viruses have also been demonstrated to have simple cellular organization. Plant viruses thus far studied are nucleoproteins without cellular organization.

Increase in parasitic habit among bacteria is in general correlated with loss of metabolic independence, with dependence on growth accessory substances furnished by the host. The capacity to reproduce outside the host's cells is in general retained by pathogenic bacteria, however. Rickettsias and viruses can reproduce only within their host cells, apparently through diversion of metabolic mechanisms of the host cells.

Classic mechanisms of active and passive immunity are operative with respect to bacteria, rickettsias and animal viruses. Antigens present in the periphery of the parasite (bacterial capsule or cell wall) and the antibodies corresponding to these peripheral antigens are determinative with respect to humoral anti-invasive immunity. Exotoxins are metabolites which are specifically neutralizable by antitoxins. In infections due to viruses a phenomenon of acquired resistance of parasitized host cells to superinfection (the interference phenomenon) may occur. This phenomenon is separate from but may supplement the mechanisms of humoral immunity. Whether or not the interference phenomenon occurs in rickettsial diseases remains to be investigated.[130]

126. Hirst, G. K.: Adsorption of Influenza Virus on Cells of the Respiratory Tract, J. Exper. Med. **78**: 99-109 (Aug.) 1943.

127. Hirst's discussion of these important experiments, which should be consulted in detail, contains the following paragraph: "While the data are meager as yet, it is tempting to formulate a tentative hypothesis as to the possible mechanism of the early stages of influenza virus infection of the respiratory cell. It may not be sufficient merely for an inhaled virus particle to come in contact with any point on a susceptible cell, and it may be necessary for it to become attached to a specific receptor substance to gain entrance. Before the virus can infect, it may also have to alter or destroy this receptor substance by means of an enzyme in order to pave the way for penetration and parasitism of that cell. Once the receptor substance is destroyed the virus becomes more firmly bound, parasitizes the cell, multiplies and again appears free in the lung, making possible spread of infection by contiguity. Since the close correlation has been demonstrated between the neutralizing and agglutination-inhibiting power of various human sera, it may be that neutralization (in mice) consists mainly of covering over that portion of the virus which ordinarily attaches itself to the receptor substance."

128. Syverton, J. T., and Berry, G. P.: Multiple Virus Infection of Individual Host Cells, Am. J. Path. **14**: 633-634 (Sept.) 1938; abstract. Syverton, J. T., and Berry, G. P.: Superinfection in Virus Induced Tumors, Science **86**: 411 (Nov. 5) 1937. Anderson, K.: Dual Virus Infection of Single Cells, Am. J. Path. **18**: 577-583 (July) 1942. Wollenman, O. J., Jr.: Generalized Vaccinia with Dual Virus Infection: A Case Report, Am. J. Path. **20**: 173-177 (Jan.) 1944.

129. Lurie, M. B.: Studies on the Mechanism of Immunity in Tuberculosis: The Fate of Tubercle Bacilli Ingested by Mononuclear Phagocytes Derived from Normal and Immunized Animals, J. Exper. Med. **75**: 247-268 (March) 1942.

130. Relationships of the microbiologic parasites to chemotherapy, and the possibilities of developing a chemotherapy against intracellular parasites, will be discussed in a section of this report to follow.

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SATURDAY, NOVEMBER 4, 1944

THE NOBEL PRIZE AWARDS

Announcement from Stockholm indicates that the 1943 and 1944 Nobel prizes in physiology or medicine have been awarded to four investigators, all of whom are now in the United States and three of whom are Americans. The prize for 1939 was the last previously awarded and was offered to Gerhard Domagk, a German, for his discovery of the use of sulfanilamide in medicine. He subsequently informed the Nobel Prize Committee that the ban of the German government on the acceptance of Nobel prizes prevented him from accepting the award.

The 1943 award was made to Drs. Edward A. Doisy, professor of biochemistry at the St. Louis University School of Medicine, and Henrik Dam of Copenhagen, who is now assistant professor of biochemistry at the University of Rochester School of Medicine and Dentistry, Rochester, N. Y., for their fundamental investigations on the chemical nature of vitamin K. Editorials in The Journal have repeatedly discussed this contribution and have often emphasized its significance. Vitamin K was discovered and named by Dr. Dam in 1935, when he observed in newly hatched chicks a fatal hemorrhagic diathesis which could be cured or prevented by the administration of a nonsaponifiable nonsterol fraction of hog liver or alfalfa. Later it was observed that the delayed clotting time of the blood was due to a low prothrombin content. The work of Doisy showed that there are at least two naturally occurring substances which have similar physiologic properties, and they are now called vitamins K_1 and K_2. These investigations have led to the use of vitamin K in obstructive jaundice, in which it has been shown to have an extraordinary protective effect against hemorrhages. It is also used in the hemorrhagic states associated with ulcerative colitis, sprue, celiac disease and the hemorrhagic state associated with primary hepatic disease and in the treatment of the physiologic hypoprothrombinemia of the newborn which exists during the first week of life. It is now almost routine to give this vitamin by injection to a woman during labor so that the newborn infant will have a normal amount of prothrombin in the circulating blood. The drug may also be given directly to the newborn infant.

The 1944 award was presented to Drs. Joseph Erlanger, professor of physiology at Washington University School of Medicine, St. Louis, and Herbert Spencer Gasser, director of the Rockefeller Institute, New York, for their studies on the function of individual nerves. Their contributions to a knowledge of the electrophysiology of nerves using the cathode ray oscillograph have yielded information of great importance in understanding the mechanism of action of the nerves. Fundamentally, Gasser and Erlanger showed that the speed of conduction is correlated with the size of the axon. The greater the diameter of the whole axon, the greater the speed of conduction. The largest fibers are motor and are therefore stimulated more easily and carry the impulse with greater speed. For instance, the sensory roots contain large, medium and fine fibers and in the order given carry the sensations of touch, pressure, pain and temperature. Studies made on conduction indicate, for instance, that cocaine will abolish sensation in the order of pain, temperature and touch, while pressure will affect sensation in the reverse order.[1]

This recognition of the contribution of the United States to medical research cannot but arouse a feeling of great pride in the physicians and in the research institutions of our country. The annual prizes are worth about $29,000 and will be divided among the winners.

"PRINCIPLES OF A NATION-WIDE HEALTH PROGRAM"

Last week some physicians in the United States received from the Committee on Research in Medical Economics of New York the galley proofs of a proposed pamphlet to be called "Principles of a Nation-Wide Health Program." The report comes with twenty-nine sponsors, who are said to have had several meetings and conferences. The expenses of the conferences and the publication were met by gifts contributed for this purpose. The physicians who participated in this planning conference included Ernst P. Boas, Allan M. Butler, Hugh Cabot, Nathaniel W. Faxon, Channing Frothingham, Alan Gregg, John P. Peters and Kingsley Roberts. Most of these names are familiar to the medical profession through their association with what was once known as the Committee of 400. Their points of view have been widely publicized again and again.

1. Erlanger, J., and Gasser, H. S.: Electrical Signs of Nervous Activity, Philadelphia, University of Pennsylvania Press, 1937. Gasser, H. S., and Erlanger, J.: The Role Played by the Sizes of the Constituent Fibers of a Nerve Trunk in Determining the Form of the Action Potential Wave, J. Physiol. **80**: 522, 1927; The Role of Fiber Size in the Establishment of a Nerve Block by Pressure or Cocaine, Am. J. Physiol. **88**: 581, 1929; Electrical Signs of Nervous Activity, London, Oxford University Press, 1937. Gasser, H. S.: The Control of Excitation in the Nervous System, Harvey Lectures **32**: 169, 1937. Gasser, H. S.; Erlanger, J.; Bronk, D. W.; Lorente de Nó, R., and Forbes, A.: Symposium on the Synapse, J. Neurophysiol. **2**: 361, 1939.

Among those who are not physicians and who apparently had leadership in the movement were I. S. Falk, attached to the Social Security Board; Michael M. Davis, who to all intents and purposes is the Committee on Research in Medical Economics; C.-E. A. Winslow of New Haven, Conn., and Edwin E. Witte of Madison, Wis. Finally there were several physicians of the U. S. Public Health Service and several teachers of economics. Without reading the "Principles of a Nation-Wide Health Program" developed by this group, any well informed physician would know the nature of the recommendations.

The purpose of the conference was the formulation of the elements of a nationwide health program which would unite the views of physicians, economists and administrators. The physicians in this conference do not represent the opinions of any considerable number of physicians in this country. Individually some of them apparently have a following of a few hundred doctors.

This report, which bears throughout innumerable indications of the authorship of Michael Davis, is replete with plausible aphorisms regarding medical care such as have marked such "literature" since Michael Davis became associated with the Rosenwald Fund. The Committee on Research in Medical Economics was established when he separated from the Rosenwald Fund. At that time a final grant of some $135,000 was apparently made so he could carry on his activities under his own auspices; this sum has apparently been supplemented from time to time with small grants from other foundations. The report attacks plans of medical care which are limited to hospitalization, surgery or catastrophic illness only and also plans which provide cash payments. It calls for association of the health program with a broad system of social security.

The report asserts that a nationwide health program demands that (1) comprehensive medical services and facilities shall be physically and financially available to all the people, (2) these services shall be so organized and supplied as to be scientifically efficient and as economical in cost as is consistent with quality, (3) the services shall be adequately and securely financed and (4) professional opportunities shall be improved and adequate income assured the persons and institutions furnishing service. These are the objectives to which practically every intelligent person will subscribe. It is then stated that the health program should be a national system with decentralized administration of services and that it should cover the entire population, but that those who wish to purchase medical care outside the national health system should be free to do so. Compulsory sickness insurance is advocated with the statement "The chief support of a nationwide system of medical care should be contributory insurance required by law, with the amounts of payment from employees, employers and self-employed persons related to the earnings of the contributors, combined with support from general taxation." General tax funds are to be secured in order to aid new or improved hospitals and health centers, particularly in rural areas, the further extension of full time public health departments and the provision or improvement of medical services to those dependent and other persons not directly covered by the insurance system, such as the chronically ill, the disabled and the aged. Free choice of physician is mentioned as a necessity, also the right of the physician to accept or reject patients and the right to participate or not to participate in the system. The voluntary hospitals, it is said, would remain as independent agencies which would make individual or group contracts for furnishing services under the national program and which would retain full responsibility for their own administration. Hospitals would retain responsibility for their administration, yet they could survive only by negotiating contracts with a governmental agency. The program proposes three methods of payment of physicians, including salary, capitation and (under certain conditions) fee for service, although it concludes that the use of the fee for service method should be discouraged.

The most important portion of this proposed program is the section devoted to the administrative organization. Here comes the statement that the national policy determining body for the national program should be representative of the chief groups of those who receive the service and of those who furnish it. The administrators of all professional and technical aspects of the program are to be qualified professional persons, the professional and the financial officials each having administrative authority in their respective fields. As might be anticipated, the proposals point again and again to the concept that the administrative control of medical services will be put in nonmedical hands.

Physicians who study this report are advised to consider particularly the next to the last paragraph. This reads:

There are numerous, important regulations which cannot be specified in a law. Some of these regulations may be national in application. Others will be designed for certain localities or will relate only to particular forms of service. These regulations must be worked out by the administrative authorities and when adopted have the force of law.

This paragraph represents the apotheosis of bureaucracy. Were the medical profession to agree to such a concept, it would be signing a blank check and turning it over to the nonmedical administrators for such disposition as they might care to make of the future of medicine.

Physicians who have followed the information made available through THE JOURNAL in recent months will

have noted the action taken in the International Labor Organization conference,[1] the action taken by the committee of the American Public Health Association [2] and now this report by Michael Davis's Committee on Research in Medical Economics. They should note that the same group has been active in all three places. They do not represent the medical profession of the United States. It is certainly questionable whether or not they represent any considerable number of people outside of themselves.

BACTERIOPHAGE ELECTRON MICROGRAPHS

Under the auspices of the Council on Pharmacy and Chemistry THE JOURNAL completes this week publication of a review of recent knowledge developed by use of the electron microscope. Already much of the practical value in the diagnosis and treatment of disease has been learned in this way.

Soon after the introduction of the electron microscope several European investigators [1] published micrographs showing the presence of minute "spermlike" particles in 'phage lysed bacterial cultures not present in 'phage free controls. More detailed studies of these presumptive "bacteriophagic sperms" have recently been reported by Luria [2] of the Guggenheim Foundation and Baylor [3] of the University of Illinois. Luria photographed 3 coli bacteriophages. One of these had a uniformly opaque "head" 45 to 50 millimicrons in diameter to which was attached a "tail" about 150 millimicrons long and 10 to 15 millimicrons thick. The head of a second coli 'phage showed opaque and translucent areas, suggesting a nucleus. A third coli 'phage was apparently without a tail. One staphylococcus 'phage was about twice the size of the first coli 'phage in all dimensions, or eight times its volume. A second tailless 'phage acting against Salmonella pullorum is described by Baylor.

The particles thus made visible breed true in homologous bacterial cultures, they are never seen in 'phage free bacterial autolysates, and their number is always directly proportional to 'phage titer. The most suggestive part of these studies, however, are studies of the method of reaction between 'phage units and homologous bacterial cells. Usually within three minutes after bacteriophage has been added to a homologous bacterial culture practically all of the 'phage particles become adherent to the limiting membranes of the bacterial cells. There is no evidence of a multiplication of the particles on the bacterial surfaces or of lytic action on the underlying parts of the bacterial cytoplasm. Luria's micrographs suggest that only one of the adherent 'phage particles is able to penetrate (or is drawn into) the bacterial cell. The other adherent particles are apparently excluded by a mechanism analogous to the exclusion of superfluous sperms by monospermatic ova. This suggests a closer genetic relationship between bacteria and homologous 'phage than previously assumed.

Following entrance of the single fertilizing 'phage unit there are local reductions in the opacity of the bacterial cytoplasm, accompanied by a capsular swelling, suggesting an increase in internal osmotic pressure. By the end of about twenty-five minutes the swelling and loss of opacity are usually complete. Rupture of the limiting membrane now takes place in one or more places. The excluded liquefied cell contents usually contain a hundred or more new 'phage particles, many of them attached to one another to form chains. The damaged or lacerated cell wall now remains as an almost invisible ghost.

This work has a suggestive bearing on current theories of virus antagonism. The suggestion that only one virus particle may enter an infected tissue cell, and that after entry it so alters the chemotactic balance as to exclude all other virus particles, is a plausible theory of epidemiologic interest. No adequate theory of the antagonism or mutual exclusion of different viruses had been previously suggested.

ARTERIOSCLEROSIS

The word arteriosclerosis is used for a variety of vascular diseases differing greatly in etiology and causative mechanism. The century old controversy with regard to the role of the various factors in the production of degenerative and sclerosing vascular lesions still continues.[1] The uncertainty and confusion interfere with the development of effective preventive and therapeutic measures. The problem has increasing medical, economic and social importance in view of the accelerated aging of the general population.[2]

Actually arteriosclerosis is not a normal sequel of aging and therefore as inescapable as gray hairs and wrinkles. In a current review of this subject Hueper [3] has evaluated the available clinical, pathologic and experimental data. He divides the known exogenous

1. The International Labor Organization on Sickness Insurance, editorial, J. A. M. A. **126**: 32 (Sept. 2) 1944.
2. American Public Health Association Health Insurance Declaration, editorial, J. A. M. A. **126**: 434 (Oct. 14) 1944; Medical Care in a National Health Program, Organization Section, ibid. **126**: 441 (Oct. 14) 1944.
1. Ruska, H.: Naturwissenschaften **28**: 45, 1940; **29**: 367, 1941. Pfankuch, E., and Kausche, G. A., ibid. **28**: 46, 1940.
2. Luria, S. E.; Delbruck, M., and Anderson, T. F.: Proc. Nat. Acad. Sc. **28**: 127, 1942; J. Bact. **46**: 57, 1943.
3. Baylor, M. R. B.; Severens, J. M., and Clark, G. L.: J. Bact. **47**: 277, 1944.

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and endogenous causes of arteriosclerosis into four main groups according to their special causative mechanism: (1) hypotonic and hypertonic vascular agents, (2) hypotensive and hypertensive intravascular hydrostatic factors, (3) colloidal plasmatic disturbances and (4) hematic anoxemic agents. The fundamental mechanism common to all these agents, according to Hueper, is an impairment of the oxygenation and the nutrition of the vascular wall. However, only colloid plasmatic disturbances of lipoid or carbohydrate nature produce foam cell atheroma and atherosclerosis, while the other agents elicit edematous, fibrosing and hyaline intimal thickening. Medial degeneration and calcification are seen with all agents, and their occurrence depends in part on the intensity of the arteriosclerogenic action of a particular agent, in part on complicating factors.

Applying these concepts to prevention and therapy of arteriosclerosis, Hueper notes that proper consideration must be given in the choice of such procedures to their suitability in the individual case in view of the existing differences in the character of the causal agent, the type of causative mechanism and the anatomic character of the vascular reaction. Thus atheromatosis and atherosclerosis require preventive and therapeutic measures different from those indicated in combating the causal factors and anatomic lesions connected with vasotonic mechanisms. Similar considerations apply also to the selection of diagnostic procedures. The concepts advanced are provocative in many respects and should stimulate physicians as well as nutritionists and chemists to adopt a more comprehensive approach to the problem of arteriosclerosis.

Current Comment

THERAPY OF ADVANCED SHOCK

Many investigators hold that there is strong contraction of the arterioles and arteries in hemorrhagic and traumatic shock and that the use of vasoconstricting agents is contraindicated and harmful because it results in further decrease of blood to important organs. Recent observations raise serious doubts of the correctness of this assumption and its therapeutic implication. Chambers and his co-workers [1] noted that a vasopressor agent is present in the blood only in the primary phase of shock, while in the late and therapeutically most important stage a vasodepressor substance predominates. In experiments on dogs with sectioned aortic depressor and carotic sinus proceptor nerves Schafer [2] found that the hypertension did not elicit any shock syndrome. These results as well as observations in surgical practice do not lend support to the theory of a sympathicoadrenal hyperactivity in shock. The application of heat in shock may aggravate the condition apparently by relaxing the peripheral vessels and thereby favoring hypotension. Cold, on the other hand, reduces the onset or severity of shock by peripheral constriction and reduction of the total vascular bed, making more blood available to internal organs. The validity of this reasoning is supported from the results obtained by Hueper and Ichniowski [3] in dogs with severe and advanced histamine shock following a slow intravenous injection of a solution of hydrophilic colloid (methyl cellulose) and a cardiovasopressor agent (s-methylisothiourea). Similar good effects on terminal hemorrhagic shock in dogs were recently recorded by Kohlstaedt and Page [4] by the consecutive administration of tuamine (2-amino heptane sulfate), a pressor amine, and blood. These results suggest that the combination of increased intravascular hydrostatic pressure and stimulation of the contractile cardiovascular tissue, which is anoxemically injured and therefore abnormally relaxed, may represent a rational therapeutic procedure in the management of advanced traumatic or hemorrhagic shock.

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RECRUITMENT OF CIVILIAN PHYSICIANS FOR ARMY DISCONTINUED

Elsewhere in this issue appears the announcement by the War Department and by the War Manpower Commission that recruitment of civilian physicians for the Army has been discontinued. The Navy requires 3,000 additional officers at once. The Army is to fill its future requirements from the young men who complete their medical education and internships. There are now 47,500 physicians on duty in the Army, including those serving with the Veterans Administration, and some 13,000 in the Navy. Three hundred additional physicians are needed for the Coast Guard. During the war emergency physicians from the Army Medical Department and the U. S. Naval Reserve will be assigned to the Veterans Administration to meet the needs of care of the veterans. In the meantime it will become necessary for the Veterans Administration to recruit additional physicians in large numbers to meet the needs of that agency when it is no longer possible to supply physicians through the armed forces.

RABIES IN NEW YORK CITY

Because of the spread of canine rabies from the borough of the Bronx to the rest of New York City the board of health has recently extended the antirabies quarantine on dogs to the entire city. One New York woman who was bitten by her pet has already died from this disease. The police department has been directed to issue court summonses to owners of dogs who allow their animals to run at large without a leash. A rigid system of quarantine is now necessary, it has been announced. Rabies in dogs and some wild animals is now so widespread that concerted nationwide efforts at its elimination through quarantine are needed.

MEDICINE AND THE WAR

ARMY

NEW ARMY STATEMENT ON REQUIREMENT AND USE OF PHYSICIANS

The requirements of the Surgeon General to maintain the established strength of Medical Corps officers on active duty will be met through the appointment of medical ASTP trainees and medical students holding inactive commissions in the Medical Administrative Corps and by calling to active duty Medical Corps officers who are on inactive status for further training as interns, junior residents or senior residents at nonmilitary hospitals. Accordingly, appointments in the Medical Corps, Army of the United States, will not be made direct from civil life except for assignment to active duty with the Veterans Administration.

All appointments resulting from applications processed in accordance with this directive will be in the Medical Corps, A. U. S., for assignment to duty with the Veterans Administration only. Every effort must be made to persuade candidates whose applications are processed under these instructions to accept this appointment.

Recalcitrant physicians, including interns and residents, will not be reported to Selective Service.

Qualified candidates who of their own volition may apply for commission in the Medical Corps and who cannot be processed under these instructions will be advised that a great need exists within the Navy and Public Health Service and will be urged to contact the appropriate offices for information regarding these services.

NEUROPSYCHIATRY FOR GENERAL MEDICAL OFFICER

According to the Technical Bulletin of Medicine No. 94, issued by the War Department recently, every medical officer, regardless of his mission, whether battalion surgeon, ward officer, flight surgeon or dispensary physician, is confronted with psychiatric problems. There is an inadequate number of psychiatrists, and, furthermore, not only must the average medical officer do most of the minor psychiatry in the Army, but in some instances he may also be forced by circumstances to do major psychiatry. Psychiatric treatment, like surgical treatment, is most effective when carried out early, promptly and skilfully. Consequently, some of the best psychiatry will be done outside the hospital in such places as the dispensary, the consultation service, the battalion aid station, the clearing station and the air strip. Because most medical officers have inadequate training in this field, the suggestions in this bulletin are presented as a general guide.

SHORTAGE OF NURSES IN THE ARMY

Major Gen. Norman T. Kirk, Surgeon General of the Army, announced recently that there is a critical shortage of nurses in the Army and that there has been a disappointing response to the call for 10,000 additional nurses. Only 500 applied out of the 4,000 expected during September. Army nurses now number about 40,000, the number in the United States having been reduced to about 13,000. About 4,000 of these are assigned to the Air Forces.

TRENCH FOOT

The War Department recently issued a change in regulations governing treatment for trench foot from that given in the Technical Bulletin of Medicine No. 81, issued August 4, as follows:

Treatment. b. Definitive treatment. (1) Patients should be kept in bed, with the affected parts on a horizontal level with or elevated on pillows only slightly above heart level, and protected from external pressure either by complete exposure or by means of a cradle. Elevation of the extremities should be done only if there is no evidence of inadequate circulation, that is, incipient gangrene; otherwise they should be maintained on a horizontal level. The period of bed rest is determined by degree and rate of subsidence of edema for this form of treatment.

ARMY AWARDS AND COMMENDATIONS

Captain Hershell B. Murray

Capt. Hershell B. Murray, formerly of West Liberty, Ky., recently received a letter of commendation from Brig. Gen. Emer Yeager for his exemplary work performed by his field hospital unit in the South Pacific war zone. The letter of commendation read, in part, "Please express to the officers, nurses and enlisted men of the 5th Field Hospital my regards and appreciation of the manner in which this unit functioned since entering this base. During the period July 13 to August 3, 1944, under adverse conditions, the hospital was constructed and operated. A great many more patients than normal for such a unit received the best possible care. It is the opinion of the surgeon of the headquarters that the entire operation was the finest done by any hospital seen in this theater. Such performance reflects the highest type training, morale and discipline." Dr. Murray graduated from the University of Louisville School of Medicine in 1932 and entered the service Sept. 13, 1942.

Major Samuel M. Klein

Major Samuel M. Klein, formerly of Jackson Heights, N. Y., was recently cited by Lieut. Gen. Mark W. Clark for "conspicuous coolness" under fire in Italy. The citation states that at Anzio last January the doctor ignored "bombing, shell fire and falling flak by continuing to perform his duties of [treating] the wounded. His selfless devotion to duty aided in saving lives. His performance reflects the high traditio of the Medical Corps." Dr. Klein served in Africa and with the first invasion of Sicily, Salerno and Anzio and now is stationed at a base hospital near Rome. Dr. Klein graduated from New York University College of Medicine, New York, in 1920. Before joining the army in August 1942 Dr. Klein was president of the Long Island City Medical Society.

Captain Bertram E. Sprofkin

The Soldier's Medal was recently awarded to Capt. Bertram E. Sprofkin, formerly of Nashville, Tenn., for heroism in making several spectacular rescues in the Southwest Pacific. The citation stated that he entered the "high and choppy seas" to bring the first soldier in from about 150 yards. Then "despite exhaustion from the first rescue," he swam to the aid of another struggling soldier, who was about 100 yards at sea and 150 yards east of him. "The action of Captain Sprofkin on this occasion undoubtedly saved the lives of both men and reflects great credit on himself and the military service." Dr. Sprofkin graduated from Vanderbilt University School of Medicine, Nashville, in 1942 and entered the service July 30, 1943.

Major Solomon Rosokoff

The Bronze Star was recently awarded to Major Solomon Rosokoff, formerly of Tonawanda, N. Y., and now an executive officer of an armored medical battalion in France. The citation read in part "He has actively coordinated much of the evacuation of the wounded in his division by liaison. In order to maintain contact with these units, Major Rosokoff subjected himself to enemy artillery, small arms fire and aerial bombardment without regard to personal safety. . . . Treatment of the wounded was reduced to a minimum, thereby saving lives." Dr. Rosokoff graduated from the University of Buffalo School of Medicine in 1935 and has been in the service for four years.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

ARMY MEDICAL DEPARTMENT DISCONTINUES RECRUITMENT OF CIVILIAN PHYSICIANS

Paul V. McNutt, chairman of the War Manpower Commission, announces that he has been informed by the War Department that recruitment of civilian physicians for the Army has been discontinued. At the same time he announces that recruitment for the Navy must continue, since it has urgent need for approximately 3,000 additional medical officers. The U. S. Public Health Service and the Veterans Administration are also continuing to recruit physicians, Mr. McNutt said.

Vice Admiral Ross T. McIntire, chief of the Bureau of Medicine and Surgery, U. S. Navy, informed Mr. McNutt that personnel expansion and intensification of operations in the Pacific have precipitated a grave shortage of medical officers.

"With less than 13,000 medical officers on active duty in the Navy, the procurement of at least 3,000 more as soon as possible is imperative," said Admiral McIntire. "Even this figure will not meet actual needs but would ease the emergency that now exists; physicians and surgeons whose availability has been or may hereafter be certified by the Procurement and Assignment Service, WMC, should lose no time in obtaining particulars for commissions in the Navy Medical Corps by communicating with their nearest office of Naval Officer Procurement."

Mr. McNutt said he had been informed that the Army will fill its future requirements for military physicians from sources now available to the Army and thereafter will not require certification of availability of additional physicians from the Procurement and Assignment Service of the War Manpower Commission. There are now about 47,500 physicians on duty as medical corps officers of the Army. This probably includes those serving with the Veterans Administration and other governmental agencies to which the Army Medical Corps assigns its medical corps officers.

Mr. McNutt said that there are at present roughly 60,000 physicians in the armed forces and the Veterans Administration. The total number of physicians in the armed forces represents approximately 40 per cent of the active medical profession of the United States.

In addition to the 3,000 medical officers needed at present by the Navy, the Public Health Service has need for approximately 300 for the U. S. Coast Guard and other agencies.

In informing Mr. McNutt of the termination of the Army recruiting of physicians except for the occasional specialist, Major Gen. Norman T. Kirk, Surgeon General of the Army, said "The large number of physicians now in the Army volunteered for commissions without regard for their personal interests. The U. S. Army Medical Department is appreciative of the fine service they have given. Their removal from their usual practice also represents a sacrifice on the part of all civilians, who have had to get along with less medical care than they obtained in peacetime."

The Veterans Administration has, and will continue throughout the duration of the war emergency to have, assigned to it medical officers in the Army and the U. S. Naval Reserve to care for the needs of the casualties in its charge, the War Manpower Commission said. Doctors whose applications are at present in process for appointment in the Army Medical Corps will be considered for appointment and assignment to duty with the Veterans Administration, the War Manpower Commission statement added.

Mr. McNutt said that the War Manpower Commission joins with the directing board of its Procurement and Assignment Service and the War Department and the Office of the Surgeon General in expressing appreciation of the sacrifice involved in cooperation that was necessary on the part of physicians and the public before the Army reached its present level of medical personnel.

Mr. McNutt also expressed the hope that additional civilian physicians will respond to the Navy's appeal for more doctors to apply for commissions. The needs of the U. S. Public Health Service and the Veterans Administration, he said, although much smaller than those of the Navy, are nevertheless important.

MISCELLANEOUS

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, October 21, page 504)

CALIFORNIA

St. Joseph's Hospital, San Francisco. Capacity, 289; admissions, 7,218. Sister M. Raymond, Superior (intern).

CONNECTICUT

Hospital of St. Raphael, New Haven. Capacity, 400; admissions, 7,986. Sister Rose Alexis, Director (interns).

Waterbury Hospital, Waterbury. Capacity, 372; admissions, 8,144. Miss Aida E. Creer, R.N., Superintendent (5 interns, 1 resident, July 1, 1945).

IOWA

Iowa Methodist Hospital, Des Moines. Capacity, 270; admissions, 8,333. Mr. R. A. Nettleton, Administrator (intern, July 1, 1945).

LOUISIANA

North Louisiana Sanitarium, Shreveport. Capacity, 121; admissions, 3,856. Mr. Herman L. Herold, Administrator (intern).

NEW HAMPSHIRE

Sacred Heart Hospital, Manchester. Capacity, 163; admissions, 2,561. Sister Mary Bernardus, R.N., Superintendent (mixed residents).

NEW JERSEY

St. Joseph Hospital, Paterson. Capacity, 460; admissions, 7,234. Sister Anna Rita, R.N., Superintendent (4 interns, 1945).

NEW YORK

Our Lady of Victory Hospital, Lackawanna. Capacity, 185; admissions, 4,143. Sister M. Bathilde, Superintendent (2 interns, Jan. 1, 1945).

OHIO

Springfield City Hospital, Springfield. Capacity, 309; admissions, 6,917. Mr. F. E. Kassner, Executive Director (2 interns).

TENNESSEE

Knoxville General Hospital, Knoxville. Capacity, 325; admissions, 7,714. Mr. T. H. Haynes, Superintendent (3 interns, April 1, 1945).

WASHINGTON

Providence Hospital, Seattle. Capacity, 434; admissions, 15,858. Sister M. Bernardine, R.N., Superintendent (2 interns; 2 residents).

WEST VIRGINIA

Charleston General Hospital, Charleston. Capacity, 380; admissions, 10,200. Dr. John E. Cannaday, Director (junior resident—surgical).

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

Deshon General Hospital, Butler, Pa.: The Deep and Superficial Mycoses, Major H. H. Sawicky, November 9; Psychoneurosis, Capt. Peter H. Knapp, November 16.

U. S. Naval Hospital, Great Lakes, Ill.: The Management of Acute Respiratory Obstructions, Dr. Paul H. Holinger, November 8; Rest, Dr. Don C. Sutton, November 21.

Camp McCoy, Wis.: Malignancies in the Army Age Group, Dr. Gorton Ritchie, November 15; Endocrinology, Dr. Elmer L. Sevringhaus, November 29; Gallbladder and Liver Disease, Dr. Erwin R. Schmidt, November 29.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

Oct. 30, 1944.

Whole Blood Flown Daily to European Front

Indicative of the ferocity of fighting in Europe, 1¾ tons of whole blood is flown daily from the United States to Paris via the U. S. A. A. F. Air Transport Command. Boston, New York and Washington are collection points for these air shipments of whole blood, administered only to the most serious casualties.

Brig. Gen. Fred W. Rankin, chief consultant in surgery to the Surgeon General of the Army, declared that continued success of the whole blood program must not be taken to mean that there should be any relaxation in blood donations for the blood plasma program. He said that blood for the preparation of plasma is still required in substantial quantities. "The whole blood program," he explained, "gives thousands of soldiers a far better chance to live than they have had with blood plasma alone. The red cells removed in the preparation of plasma are the oxygen carriers, without which a severely bleeding man cannot live, no matter how much fluid is given him. In cases of severe shock and bleeding with advanced anemia, and where emergency operation is necessary, whole blood is essential in the preservation of life."

Whole blood shipments are speeded, according to the War Department, through careful preparation and packing at Red Cross donor centers. This permits the blood to be rushed to the front lines with very little handling. Blood taken from a donor is placed directly in the quart bottle which is used for the transfusion in Europe. After use of a preservative solution, the bottles are hermetically sealed and placed, six to a crate, in wooden packages. The packages are given a class 1 air priority but otherwise receive no special handling. Unloaded from the C-54s in Paris, the blood packages are rushed to the front by air and truck.

Pensions for Disabilities

Disabilities incurred in or aggravated from service in the present war are the basis of pensions granted to 271,000 veterans up to October 1, according to Brig. Gen. Frank T. Hines, administrator of veterans' affairs. Death pensions are being paid to dependents of 38,000 men who lost their lives in service during the present war or died after discharge of a service incurred disability. A total of 87,000 policies of National Service Life Insurance, purchased by members of the armed forces, have matured on account of death of the insured, and beneficiaries of those deceased veterans are receiving monthly cash benefits. These cash insurance payments totaled more than $46,000,000 up to July 31 and are additional to the death pensions referred to as being paid. These matured insurance policies have a face value of $729,000,000. Altogether there have been 16,300,000 insurance applications, with a total face value of $124,000,000,000. The latter sum is almost equal to the face value of all outstanding policies in private and mutual life insurance companies.

Gen. Hines said that 104,000 veterans of the present war have received treatment in veterans' hospitals, 15,000 are still being treated and 89,000 have been discharged as cured or having received maximum benefit.

Postwar Venereal Disease Conference Plans

The international character of the postwar venereal disease control conference, to be held November 9 to 11 in St. Louis, was revealed today in an announcement by Surgeon General Thomas Parran and Dr. J. R. Heller Jr., chief of the Venereal Disease Division of the U. S. Public Health Service of the Federal Security Agency. They said that representatives of Canada, England, Norway, Mexico and the United States would discuss problems related to the international control of venereal diseases. The conference will consider methods of broadening the application of recent advances in venereal disease treatment. It brings together experts in all phases of venereal disease control. Reporting will be done by Dr. Melville MacKenzie, principal regional medical officer, British Ministry of Health, and chief medical adviser to the Interallied Committee for Postwar Requirements, Dr. Enrique Villela, venereal disease control officer of the federal health department of Mexico, Dr. Thorstein Guthe, assistant to the surgeon general of public health of Norway, Lieut. Col. Donald H. Williams, chief of the division of venereal disease control, Canadian Department of Pensions and National Health, and Dr. R. A. Vonderlehr, medical director for Puerto Rico, of the U. S. Public Health Service.

Medical Economic Abstracts

PREPAYMENT SURGICAL AND OBSTETRIC PLAN FOR OKLAHOMA

The House of Delegates of the Oklahoma State Medical Association met in Oklahoma City, October 22, and adopted a report to set up a prepayment surgical and obstetric plan as recommended by a committee that had been investigating the desirability of establishing such a plan for the state. The vote on the report, it is understood, was practically unanimous. The committee submitted the following recommendations to the House of Delegates and they were agreed to: (1) That the House of Delegates take definite action to establish a prepaid medical and/or surgical plan; (2) that the plan be organized under the existing insurance laws of the state of Oklahoma; (3) that the plan be a nonprofit corporation; (4) that the plan shall recognize the age old practice of free choice of doctors of medicine and free choice of approved hospitals; (5) that the payment of services be on an indemnity basis; (6) that this plan be incorporated and set up on a statewide basis, but financing would be worked out by the board of trustees in such a manner that any participating county shall pay a pro rata share of capital in proportion to its membership as they are admitted to service; and (7) that the council of the Oklahoma State Medical Association select a board of trustees of fifteen members, nine of whom shall be doctors of medicine and six of whom shall be laymen—these to serve as the original incorporators and who, with legal assistance, will set in force the plan. It is suggested that the term of office of these trustees should be staggered and they should be selected as nearly as possible with an idea of geographic distribution of the state.

Society Proceedings

COMING MEETINGS

American Academy of Pediatrics, St. Louis, Nov. 9-11. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.

American Society for the Hard of Hearing, New York, Nov. 10-12. Mr. Raymond H. Greenman, 1537 Thirty-Fifth St., N.W., Washington 7, D. C., Managing Director.

Annual Conference of State Secretaries and Editors, Chicago, Nov. 17-18. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.

New York State Association of Public Health Laboratories, Albany, Nov. 17. Miss Mary B. Kirkbride, New Scotland Ave., Albany 1, Secretary.

Puerto Rico, Medical Association of, Santurce, Dec. 15-17. Dr. E. Martinez-Rivera, P. O. Box 3866, Santurce, Secretary.

Southern Medical Association, St. Louis, Mo., Nov. 13-16. Mr. C. P. Loranz, Empire Building, Birmingham 3, Ala., Secretary.

Western Surgical Association, Chicago, Dec. 1-2. Dr. Arthur R. Metz, 250 East Superior St., Chicago, Secretary.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

COLORADO

The Friedman Lectures.—The 1944 Friedman Lectures, presented by the National Jewish Hospital, Denver, in cooperation with the Medical Society of the City and County of Denver and the University of Colorado School of Medicine and Hospitals, will be presented November 6-8. Guest lecturers will be Drs. Philip D. Wilson, clinical professor of orthopedic surgery, Columbia University College of Physicians and Surgeons, New York; Rudolf Nissen, attending surgeon, Jewish Hospital, Brooklyn, and Edgar Mayer, assistant professor of clinical medicine, Cornell University Medical College, New York. The program is as follows:

Dr. Wilson, Treatment of Tuberculous Arthritis, November 6.
Dr. Nissen, Operative Treatment of Air Cyst of the Lung and of Recurrent Spontaneous Pneumothorax, November 6.
Dr. Mayer, Light and X-Ray Therapy of Tuberculosis, November 7.
Dr. Wilson, Dr. Mayer and Dr. Atha Thomas of Denver, Clinic on Tuberculous Arthritis, November 7.
Dr. Mayer, Diagnosis of Pulmonary Emphysema, November 7.
Dr. Nissen, Dr. Mayer and Dr. George B. Packard of Denver, Conference on Pulmonary Surgical Problems, November 7.
Dr. Nissen, Surgical Treatment of Funnel Chest, November 7.
Dr. Wilson, Reconstructive Surgery in the Treatment of War Wounded, November 7.
Dr. Nissen, Experimental Studies of Pulmonary Atelectasis and Its Bearing on Clinical Observations, November 8.

FLORIDA

Dr. Dame Appointed Director of Health Service.—Dr. George A. Dame, Fernandina, for a number of years director of the Nassau County Health Department, has been appointed state director of local health service for the Florida State Board of Health in Jacksonville.

District Meeting.—Dr. John R. Schenken, professor and director of the department of pathology and bacteriology, Louisiana State University School of Medicine, New Orleans, addressed the Second District Medical Society of Florida at Quincy, October 19, on "Relationship of Hormones to Cancer" and on the "Pathology of Amebiasis."

ILLINOIS

Changes in Licensure.—The Illinois State Department of Registration and Education on August 9 revoked the license to practice medicine of Dr. Emil Gleitsman, Chicago, on the grounds of his conviction of murder. On August 1 the board restored the license of Dr. Milton M. Glascoe, Peoria.

Chicago

Dr. Judd to Speak.—Dr. Walter H. Judd, representative from the fifth district, Minnesota, will address an open meeting at Thorne Hall, Northwestern University, November 13, at 11 a. m. on "Medical Approach to Socialization." The lecture will be delivered under the auspices of Pi Kappa Epsilon, honorary medical fraternity.

Miller Cancer Fund.—A gift of $5,000 for cancer research has been received by the University of Chicago School of Medicine from Mr. R. T. Miller Jr., educator and publisher, Scottsville, N. Y., and Chicago. The sum is in addition to an earlier gift of $15,000 to be expended for current needs. The fund was created as a memorial in honor of Mr. Miller's brother, Mr. O. C. Miller.

The Bacon Lectures.—Dr. Arthur T. Hertig, assistant professor of pathology and associate in obstetrics, Harvard Medical School, Boston, will deliver the Charles S. Bacon Lectures at the University of Illinois College of Medicine, December 6-7. The first lecture will be on "Development of the Early Human Ovum Prior to the First Missed Menstrual Period" and the second on "Pathogenesis of Hydatidiform Mole with a Clinicopathologic Correlation in 200 Cases."

IOWA

Forty-Two Years as Professor.—Dr. John T. McClintock recently retired as professor and head of the department of physiology, State University of Iowa College of Medicine, Iowa City, after holding the position for forty-two years. Harry M. Hines, Ph.D., professor of physiology, has been appointed to succeed Dr. McClintock. William Kendrick Hare, Ph.D., formerly associate professor of anatomy, has been appointed associate professor of physiology and Samuel B. Barker, Ph.D., instructor in physiology, University of Tennessee College of Medicine, Memphis, has been appointed assistant professor.

Administrative Change at Psychopathic Hospital.—Dr. Wilbur R. Miller has been appointed medical director of the Iowa State Psychopathic Hospital, Iowa City, in his capacity as professor and head of the department of psychiatry in the State University of Iowa College of Medicine, Iowa City. Naming Dr. Miller in this capacity will relieve the administration of the University Hospitals of the administrative responsibilites in the psychopathic hospital, it was reported. The change was made at the request of Robert E. Neff, administrator of the University Hospitals. Dr. Miller was appointed assistant professor of psychiatry in the college of medicine and senior assistant physician in the psychopathic hospital in 1937, becoming professor and head of the department of psychiatry July 1, 1943 to succeed Dr. Andrew H. Woods. Dr. Woods retired July 1, 1941 and became professor emeritus.

MAINE

Conference of Social Welfare.—The thirty-fifth annual Maine Conference of Social Welfare will be held in Bangor, November 8-9. Among the speakers will be:

Charles L. Williams, assistant surgeon general, U. S. Public Health Service, Public Health Goals in Maine.
Dr. Frederick C. Thorne, Brandon, Vt., A Statewide Mental Hygiene Program.
Lieut. Col. Wilfred Bloomberg, M. C., The Health and Psychiatric Problems of the Returning Veteran.

MASSACHUSETTS

Personal.—Dr. Dwight O'Hara, dean, Tufts College Medical School, Boston, has been named acting director of the industrial medicine division of the loss prevention department, Liberty Mutual Insurance Company. Dr. David A. McCoy, director of the division, has been given leave of absence to accept a commission as lieutenant in the U. S. Navy.——Dr. Gordon M. Morrison, Boston, was recently named a member of the state board of registration in medicine.

Staff Memorial Fund.—The general executive committee of the Massachusetts General Hospital, Boston, has voted to establish a staff memorial fund to which contributions may be made in honor of the memory of any staff member. The use of the fund will be directed by the general executive committee. The idea stemmed from a wish to honor Dr. William Bradley Breed, who at the time of his death, August 21, was a member of the general executive committee and who had been serving the hospital almost continuously for twenty-five years.

NEBRASKA

Ninety-Four Years of Age.—Dr. Frank J. Rosenberg, Lexington, observed his ninety-fourth birthday August 16. Dr. Rosenberg graduated at the Eclectic Medical Institute, Cincinnati, in 1873.

NEVADA

State Medical Election.—Dr. Daniel J. Hurley, Eureka, was chosen president-elect of the Nevada State Medical Association at its meeting in Reno, September 23, and Dr. John R. McDaniel Jr., Las Vegas, was installed as president. Other officers include Dr. John A. Fuller, Reno, vice president and Dr. Moreton J. Thorpe, Reno, secretary-treasurer.

NEW JERSEY

The 1945 State Meeting.—The Medical Society of New Jersey will hold its one hundred and seventy-ninth annual meeting at the Claridge Hotel, Atlantic City, May 22-24.

Dr. Liva Named Dean of Essex Medical School.—Dr. Arcangelo Liva, Hackensack, a member and past president of the Bergen County Medical Society, has been appointed dean of the recently organized Essex College of Medicine, Newark (THE JOURNAL, September 9, p. 115).

Ringworm Epidemic.—An outbreak of ringworm among school children in Jersey City had reached epidemic proportions, according to Dr. Claudio E. McNenny, chief of the communicable diseases division of the city board of health, as reported in the New York *Times*, September 29. A special clinic has been opened in Jersey City to treat children suffering from the infection, which is said to be highly contagious.

Tuberculosis League.—The thirty-eighth annual meeting of the New Jersey Tuberculosis League was held at the Hotel Stacy-Trent, Trenton, October 17. Among the speakers participating in a panel discussion on "Problems of Developing a Program for the Discovery and Prevention of Tuberculosis in Industry" were Dr. Leopold Brahdy, New York, Louis Horowitz, area director, War Relief Committee, Congress of Industrial Organizations, Dr. A. Joseph Hughes, Camden, and Dr. John F. Johnson, Trenton. In a session devoted to "Forty Years of Progress in Stamping Out Tuberculosis" the speakers included Dr. Charles J. Hatfield, Philadelphia; Louis I. Dublin, Ph.D., New York; Dr. Frederick H. C. Heise, Trudeau, N. Y., and Clyde R. Miller, Ph.D., New York.

NEW YORK

Graduate Lecture.—Dr. John G. Fred Hiss, professor of clinical medicine, Syracuse University College of Medicine, Syracuse, will address the Erie County Medical Society in Buffalo, November 28, on "Common Errors in the Diagnosis of Heart Disease, with Special Reference to Rheumatic Heart Disease."

Personal.—At the recent graduation exercises of the New York Medical College, Flower and Fifth Avenue Hospitals a "gold diploma" signifying fifty years of service in the practice of medicine was presented to Dr. William L. Love, Patchogue. ——Dr. Elias W. Young has been appointed substitute village health officer of Goshen, succeeding the late Dr. Ralph L. McGeoch, who held the position during the absence of Dr. Nathaniel T. Keys.

New York City

Bailey B. Burritt Retires.—Bailey B. Burritt, A.M., retired on November 1 as chairman of the executive council of the Community Service Society of New York under the group's retirement plan. He has served the society for thirty-one years. A newly created position of general director will be filled by Stanley P. Davies, Ph.D., executive director of the society since its formation by merger in 1939.

Artists Cooperate in Health Posters.—A special exhibit is on display at the Wilderstein Galleries showing the conception of famous artists on health education. The pictures and their captions were developed under the leadership of Madame Elsa Schiaparelli as chairman of a special committee on health posters with the assistance of the American Museum of Health. The posters are intended primarily for use in public health programs to be carried on in Europe after the war and in the meantime are available for reproduction and use in this country. One of the features of the exhibition is a poster on syphilis by Salvadore Dali; there are also health education studies by Vertes, Helion, Donati and Farbes.

Diabetes Clinical Society Organized.—The Clinical Society of the New York Diabetes Association has been organized with the following officers: Drs. John J. Weber, Brooklyn, chairman; Louis Bauman, New York, first vice chairman; Edmund L. Shlevin, Brooklyn, second vice chairman, and Harry G. Jacobi, New York, secretary-treasurer. The society is functioning under the auspices of the parent organization and is somewhat of an outgrowth of the clinics committee, which has now been dissolved. The society will consist of fellows, associate fellows and members. A carefully selected founding group of specialists in diabetes will constitute the nucleus of the fellowship; this group will formulate standards for subsequent admission to fellowship and associate fellowship and will be the sole body which votes in future fellows. The board of directors of the New York Diabetes Association wishes to establish a representative founding group from among the specialists in the five boroughs and has appointed a nominating committee to examine credentials and to make recommendations. The new society will take over the establishing of standards for diabetes clinics in New York City and the vicinity. It will aim to bring about general adoption of these standards and for this purpose will recommend to the parent organization certification of individual hospital clinics adequately meeting its prescribed standards, as well as withdrawal of certification on delinquency. It will initiate, conduct and publish statistical surveys on the basis of data derived from certified clinics. It will promote constructive relationships between physicians who are specialists in diabetes and representative physicians of allied medical specialties, such as ophthalmologists and surgeons, who will selectively be admitted to the fellowship. It will have contact with related technical groups such as dietitians, laboratory technicians, nurses and social workers through the "member" category. It will by close mutual association promote scientific understanding and conquest of problems in the management of diabetes, especially as these are encountered in clinical practice. The inaugural meeting of the society was held at the University Club, October 26.

Mayor's Health Plan Launched.—The Health Insurance Plan of Greater New York, proposed by Mayor Fiorello La Guardia this year, was informally organized at a meeting on October 19. Temporary officers were chosen and the honorary title of Founder conferred on the mayor. Among the temporary officers are Dr. Willard C. Rappleye, chairman, dean of the Columbia University College of Physicians and Surgeons, and Mr. Winslow Carlton, secretary; Dr. John J. Wittmer and Matthew Woll, labor leader, are among the vice presidents. About $200,000 is now available for underwriting the program, of which $150,000 is pledged by the New York Foundation and $25,000 by the Albert and Mary Lasker Foundation. The plan aims to provide comprehensive medical and surgical services at moderate cost to all persons living or working in New York and earning up to $5,000 a year (THE JOURNAL, May 13, p. 161). The New York *Times* in reporting the meeting stated that one of the main tasks of the directors would be to obtain the cooperation of the five local county medical societies. These groups, while endorsing the plan in principle, are opposed to the $5,000 income ceiling for eligibles, preferring a ceiling of $2,500 or, at most, $3,000. It will be up to the directors, it was said, to convince the organized medical groups that a $5,000 ceiling is needed to obtain group enrolments that will include section heads, foremen and other employees in supervisory positions. Another important job set for the directors by the mayor is to convince the medical societies that "teamwork medicine" should be part of the program. The mayor cited the advantages of group medicine as practiced in other cities. Coverage would also extend to members of their families under 18 years of age. The plan cannot begin to function, it was said, until the state insurance department has approved the financial setup.

Another Diploma Mill.—George William Manus, 24 years old, was taken into custody October 13 charged with operating a diploma mill in a two room suite at 103 Park Avenue which specialized in doctorates, the New York *Herald Tribune* reported. He was arraigned before Judge Frederick L. Hackenburg in special sessions for alleged violations of the state education and penal laws and was held in $5,000 bail for a hearing that was to be held October 16. An investigation by the court disclosed that Manus had issued some 4,000 "degrees" for fees running from $450 to $800. From letterheads and documents found in the office, police were reported to have said that Manus represented himself as a physician with an M.D. degree from White Cross Medical College of the University of Physicians and Surgeons of Southern California. He also called himself executive vice dean and treasurer of the New York College of Psychiatry. Both institutions were allegedly mythical. "His pet institutions" for which he issued his diplomas were called "Extension Branch of Los Angeles University, College of Psychiatry," and the "Golden State University of Los Angeles." The former is said to be nonexistent and the latter is the outgrowth of the Eldridge Drugless Colleges incorporated in California in 1922. A report on the school published in the *Federation Bulletin* in May 1940, page 151, stated that all schools in the United States should be aware of the fact that degrees given by the schools are of "diploma mill" worth. The newspaper reported that the courses of study offered by Manus included hypnotic, painless and drugless childbirth, prenatal suggestion, instantaneous hypnotism, reflex therapy (described as a method for growing hair on bald heads), practical and applied psychology, suggestion and autosuggestion, psychological somnotherapy, suggestive therapeutics, color therapy, vibro therapy, chemical psychology and chemical psychotherapy, advanced esoterics and metaphysics. His specialty was the solicitation of chiropractors as postgraduate students in "psychological healing" in all its branches, leading to such degrees as doctorate of philosophy in psychology for a fee of $500, doctorate of science for a fee of $800, formerly $1,000, and doctorate of psychotherapy for a fee of $450. The New York County Grand Jury handed down an information against Manus on October 10 charging him with violations of section 66 of the state education law in that his "college" functioned without having been chartered by the state board of regents; conducting business under an assumed name without having filed a certificate with the county clerk; using the title "Doctor" in connection with public health matters without legal authorization in violation of the educational law, and issuance of descriptive material implying that his institution was a school of medicine, without sanction of the board of regents.

NORTH CAROLINA

New Professor of Pharmacology.—Dr. Arnold J. Lehman, associate professor of pharmacology, Wayne University College of Medicine, Detroit, has been appointed professor of pharmacology at the University of North Carolina School of Medicine, Chapel Hill. Dr. Lehman graduated at Stanford University School of Medicine, San Francisco, in 1936.

Changes in Health Personnel.—Dr. Greene L. Rea, who has been associated with the public health department in Charlotte for twenty-three years, was not to be assistant health officer after October 1, with the abolition of this position in the department. The decision to discontinue the position was reached during a recent reorganization of the health department under the direction of Dr. William R. Cameron.——Dr. Oscar David Garvin, health officer of Richmond and Scotland counties, has been appointed to a similar position in Chatham, Orange and Person counties to succeed Dr. William P. Richardson, Chapel Hill, who resigned to become a district director in the division of local administration of the state board of health, it is reported.

OHIO

Personal.—Dr. William E. Mishler, Cleveland, has been appointed chief surgeon of the Erie Railroad to succeed Dr. James Frank Dinnen, who is retiring because of ill health. Dr. Dinnen has been associated with the Erie Company since 1927; he had been assistant chief surgeon of the Nickel Plate Road for nineteen years assisting his father, who had been chief surgeon there since 1881, the Cleveland *Plain Dealer* reported.

Torald Sollmann Honored.—On September 25 Dr. Torald H. Sollmann, dean emeritus and professor emeritus of pharmacology and materia medica, Western Reserve University School of Medicine, was guest of honor at a dinner and presented with a silver plaque in recognition of his distinguished services. Winifred G. Leutner, LL.D., president of Western Reserve University, was toastmaster of the affair, which was sponsored by the faculty and alumni of the medical school. Dr. Sollmann, who had been associated with the school for nearly fifty years, is chairman of the Council on Pharmacy and Chemistry of the American Medical Association.

Broadcast in Health.—The Cleveland Health Museum, in cooperation with the Academy of Medicine of Cleveland and the Cleveland Dental Society, has resumed its radio programs over station WGAR. The series, which opened October 3 with a talk by J. V. Gentilly, D.D.S., and Dr. Gerald B. Hurd, on "A Tooth for Every Baby?" includes:

Dr. Robert F. Parker, Penicillin, October 10.
Ralph E. Creig, D.D.S., Your Child's Teeth, October 17.
Dr. Horace E. Mitchell, Lakewood, Foreign Bodies in Food and Air Passages, October 24.
C. C. Buckis, D.D.S., and Thomas F. Healy, D.D.S., Those Six Year Molars, October 31.
Dr. Middleton H. Lambright, Warning Signs of Cancer, November 7.
Dr. Howard Lester Taylor, The Health Museum, November 14.
Dr. Charles E. Kinney, To Protect Your Child's Hearing, November 21.
Leon E. Newman, D.D.S., and William C. Stillson, D.D.S., Teeth of the Teen Age, November 28.

Medical Library Observes Fiftieth Anniversary.—The Cleveland Medical Library Association will celebrate its fiftieth anniversary, November 26-27. On the first day the library will be open for public inspection and Dr. Normand L. Hoerr, professor of anatomy, Western Reserve University School of Medicine, Cleveland, will deliver an address entitled "The Forgotten Man in Medical Education." A jubilee banquet will be held the second evening at which members of the library association will be hosts to invited civic leaders, educators, librarians and honorary consultants to the Army Medical Library. As a feature of the anniversary the association is planning the publication of a catalogue of the famous Nicolaus Pol Library, of which the Cleveland Medical Library possesses the largest nucleus. The project is under the direct supervision of Dr. Max E. Fisch, curator of incunabula in the Army Medical Library.

OREGON

Medical Students Recommended for Membership.—At the recent annual meeting of the house of delegates of the Oregon State Medical Society it was voted to recommend to the council that a membership for medical students be created. The president of the society was also authorized to apprise Governor Earl Snell that the establishment of a university hospital at the University of Oregon Medical School, Portland, for patients on the indigent level was favorably considered. A questionnaire seeking the profession's reaction to the proposal, which was issued by the dean of the medical school, states that the project was being planned to improve facilities for teaching medical students and "to provide a diagnostic service for doctors of the state for patients on the indigent level."

Physicians in the Legislature.—*Northwest Medicine* reports the following physicians as candidates in the Oregon legislature:

Dr. Ferdinand H. Dammasch of Multnomah County, a past president of the Multnomah County Medical Society, who was a member of the joint ways and means committee and chairman of the house committee on medicine, pharmacy and dentistry at the 1943 session, is again a candidate in the November election. Dr. Dammasch also served in the 1933 session.

Dr. William T. Johnson of Benton County, former president of the Oregon State Medical Society, is also a candidate for the house.

Dr. James A. Best of Umatilla County, holdover senator, is one of the veteran members of the senate, having served in the 1935, 1937, 1939, 1941 and 1943 sessions. He also served as representative in the 1933 session.

Dr. Joel C. Booth of Linn County, a past president of Central Willamette Medical Society, is also a holdover senator. Dr. Booth is a senior senator with service in the 1931, 1933, 1939, 1941 and 1943 sessions.

Dr. William A. Moser of Josephine County is a new candidate for the senate.

PENNSYLVANIA

Special Society Election.—Dr. Michael J. Penta was installed as president of the Reading Eye, Ear, Nose and Throat Society at its recent meeting in Reading. Other officers include Drs. Roland M. Brickbauer, first vice president, Isaac B. High, second vice president and president-elect, Harold L. Strause, treasurer, and Paul C. Craig, secretary.

Philadelphia

Annual Dinner of Resident Physicians.—The fifty-eighth annual dinner of the Association of Ex-Resident and Resident Physicians of the Philadelphia General Hospital will be held on December 5 at the Bellevue-Stratford Hotel, with Dr. George Wilson presiding as toastmaster. Ex-residents who do not receive notices of the dinner are requested to send their correct addresses to the secretary, Dr. Robert C. McElroy, 133 South 36th Street, Philadelphia 4.

TEXAS

Auxiliary Library Endowment Fund.—The Woman's Auxiliary library endowment fund was established September 18, when a check for $1,000 was received in the office of the State Medical Association of Texas from the treasurer of the auxiliary. The donors of this, the first endowment fund of the auxiliary, are Mr. and Mrs. G. A. Ray, Pettus, who established this fund in memory of their daughter, Romayne Ray, who died Sept. 12, 1941. The fund is to be known as "The Romayne Ray Memorial Fund."

Personal.—J. Allen Scott, Sc.D., associate professor of epidemiology and medical statistics at the University of Texas School of Medicine, Galveston, is participating in the organization and work of a parasitology survey in the Amazon area at Belem, Brazil, under the auspices of the Rockefeller Foundation and the Office of the Coordinator of Inter-American Affairs. He will return to his duties at Galveston in November.——Dr. Julius C. Davis, Rule, has been appointed a member of the state board of health to succeed Dr. Samuel E. Thompson, Kerrville, resigned.

State Surgeons Choose Officers.—Dr. Samuel D. Weaver, Dallas, was elected president of the Texas Surgical Society during its meeting in Galveston, October 2-3. Other officers include Drs. Jared E. Clarke, Houston, and George R. Enloe, Fort Worth, vice presidents; Walter G. Stuck, San Antonio, secretary, and Elbert Dunlap, Dallas, treasurer. Among the speakers at the meeting included:

Dr. John W. Duckett, Dallas, Surgical Treatment of Tumors of the Liver.
Dr. Enloe, Adenoma of Pancreatitis with Hyperinsulinism.
Dr. Johnson Peyton Barnes, Houston, A Simple, Safe, Efficient Method of End to End or End to Side Intestinal Anastomosis.
Dr. George V. Brindley, Temple, Presacral Tumors.
Dr. George W. N. Eggers, Galveston, Chronic Dislocation of the Metacarpal of the Thumb.
Dr. Frank C. Beall, Fort Worth, Deficient Fixation of the Right Colon.
Dr. Marcos Fernan-Nunez, Milwaukee, Tropical Surgery.
Capt. Stirling E. Russ and Capt. John S. Gaynor, M. C., Spontaneous Rupture of the Spleen.

The second day's program was devoted to clinical sessions. Features of the meeting included a talk by Stewart H. Evans, Galveston, British vice consul (honorary), entitled "A Clipper Trip to England" and an exhibit of drawings, sketches and etchings by Charles M. Pomerat, Ph.D., professor of anatomy, University of Texas Medical Branch, Galveston.

"Magnetic Ray Belt Maker" Fined.—Dr. Frank B. Moran, Dallas, who graduated at the University of Michigan Department of Medicine and Surgery, Ann Arbor, in 1894, was sentenced to ten days in jail and fined $750 recently when a ruling was handed down that the physician had violated an injunction issued by the court in 1942 against transporting in interstate commerce his "magnetic ray belt," the *Texas State Journal of Medicine* reported. The belt is said to be made and sold by the Magnetic Ray Company, reputedly owned by Dr. Moran. The injunction was granted on petition of the government on the ground that the belt was mislabeled, it was stated.

VIRGINIA

Personal.—Dr. William A. Browne, city health officer of Alexandria, has been appointed epidemiologist of Richmond effective October 1. Dr. Browne held the Richmond position from 1935 to 1940. He once held a similar position in the New York City health department. He carried on a survey of scarlet fever in Richmond under the auspices of the Rockefeller Foundation, it is reported.

Faculty Changes at College of Virginia.—A department of physical medicine has been created under a recent grant by the Baruch Committee on Physical Medicine to the Medical College of Virginia, Richmond. Dr. Frances A. Hellebrandt, associate professor of physiology, University of Wisconsin Medical School, Madison, has been named professor of physical medicine, effective October 1, and Dr. Ernst Fischer, associate professor of physiology at the college, has been transferred from the department of physiology to the department of physical medicine with the rank of professor of physical medicine. Robert W. Ramsey, Ph.D., of the University of Rochester School of Medicine and Dentistry, Rochester, N. Y., has been named associate professor of physiology.

WASHINGTON

Industrial Hygiene Division Named Information Center in New Program.—The industrial hygiene division of the Washington State Department of Health was selected as an information center in a new cooperative industrial program in the state. The program was launched at a recent meeting in Seattle sponsored by the Seattle Safety Council and attended by representatives from labor, industry, government agencies and the medical profession. To avoid overlapping in a concentrated industrial health program, committees were appointed and industrial health problems were broken down into eight brackets: nutrition, safety, sanitation, occupational diseases, venereal disease, tuberculosis and other communicable diseases and plant medical facilities, including medical, dental, nursing and first aid activities. The industrial hygiene divison of the state health department will function as an information bureau by referring each problem that comes to it from industry, labor or others to the appropriate committee, which in turn will decide where the responsibility lies under the coordinated program. According to *Northwest Medicine* it is believed that this service through the information bureau and the permanent committees will reduce confusion due to duplicated effort, overlapping activity and conflicting recommendations. Agencies cooperating in the program include the Committee on Congested Production Areas, King County Health Department, National Committee for the Conservation of Manpower in War Industries, Seattle City Health Department, Seattle Safety Council, Smaller War Plants Corporation, state health department, State Department of Labor and Industries, State Nutrition Committee, U. S. Army, U. S. Bureau of Mines, U. S. Department of Labor, U. S. Maritime Commission, U. S. Navy, U. S. Public Health Service, War Food Administration, War Manpower Commission, War Production Board labor production division, War Production Board production drive, Washington State Social Hygiene Association and the Washington Tuberculosis Association.

GENERAL

Urology Award.—The American Urological Association offers an annual award "not to exceed $500" for an essay (or essays) on the result of some specific clinical or laboratory research in urology. The amount of the prize is based on the merits of the work presented, and, if the committee on scientific research deems none of the offerings worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years. All interested should write the secretary for full particulars. The selected essay (or essays) will appear on the program of the June 1945 meeting of the American Urological Association. Additional information may be obtained from the secretary, Dr. Thomas D. Moore, 899 Madison Avenue, Memphis, Tenn., who must receive competitive essays on or before March 15.

Association of American Medical Colleges.—Dr. John Walker Moore, Louisville, was chosen president-elect of the Association of American Medical Colleges during its annual meeting in Detroit, October 23-25, and Dr. Albert C. Furstenberg, Ann Arbor, Mich., was installed as president. Dr. William S. McEllroy, Pittsburgh, was elected vice president and Drs. Fred C. Zapffe and Arthur C. Bachmeyer, both of Chicago, were reelected secretary and treasurer respectively. Drs. Walter A. Bloedorn, Washington, D. C., and Wilburt C. Davison, Durham, N. C., were chosen members of the executive council of the association, succeeding Drs. Willard C. Rappleye, New York, and Russell H. Oppenheimer, Atlanta, Ga., whose terms expired. The 1945 session will be in New Orleans, October 29-31.

Special Society Elections.—Dr. Alan C. Woods, Baltimore, was named president-elect of the American Academy of Ophthalmology and Otolaryngology at its annual meeting in Chicago, October 12, and Dr. Gordon B. New, Rochester, Minn., was inducted into the presidency. New vice presidents include Drs. Edmund B. Spaeth, Philadelphia, William H. Johnston, Santa Barbara, Calif., and Major Brittain F. Payne, M. C. The next annual meeting will be held at the Palmer House, Chicago, Oct. 7-11, 1945.——Dr. William Bates, Philadelphia, was named president-elect of the United States chapter of the International College of Surgeons at its annual meeting in Philadelphia, October 4, and Dr. Rudolph Jaeger, Philadelphia, was inducted into the presidency. Other officers include Major Charles H. Arnold, M. C., secretary, and Dr. Benjamin I. Golden, Elkins, W. Va., treasurer. It was announced during the meeting that the international headquarters would be transferred from Geneva, Switzerland, to New York.

Courses for Orthopedic Surgeons.—The American Academy of Orthopaedic Surgeons has prepared a series of instructional courses to be presented at its annual meeting in Chicago, Jan. 20-24, 1945. The courses will deal with the shoulder, the hip, the knee and the foot. The instruction periods will deal first with the orthopedic anatomy, then with the practical application from the standpoint of symptoms and pathology, the treatment of disease conditions occurring in each one of these regions and finally the treatment of traumatic conditions. Four courses on physiology will be offered covering nerves, joints, bones and muscles as they pertain to various phases of orthopedic surgery. There will also be courses on infantile paralysis, spastic paralysis, fractures and x-rays in orthopedic surgery. On Saturday evening, January 20, the instructional course dinner will be held with an "information please" type of program of interest to military and civilian orthopedic surgeons. During the session a symposium on degenerative hip pathology is also planned as well as a series of talks on fractures, reconstruction surgery, treatment of infections and trauma.

Cancer Society Absorbs Foundation.—The recently formed National Foundation for the Care of Advanced Cancer Patients was absorbed October 10 into the American Cancer Society, according to the New York *Herald Tribune*. Under the arrangement, it was stated, the cancer society, which is 31 years old, will devote part of the funds collected nationally to provide care for incurable cancer patients of moderate means in addition to its present activities in supporting research and education in the prevention and cure of cancer. The merger was announced by Clarence C. Little, ScD., managing director of the American Cancer Society, and Julius J. Perlmutter, organizer and president of the national foundation, which was incorporated last May (THE JOURNAL, May 20, p. 221). It was stated that the organizations joined forces to avoid any confusion that might follow separate national campaigns for funds. The foundation will temporarily maintain its offices at 1450 Broadway, but its activities and records were to be transferred immediately to the cancer society's offices at 350 Madison Avenue. In an announcement Dr. Frank E. Adair, president of the American Cancer Society and vice president of the foundation, said that the former group will stimulate establishment of hospitals and homes to care for hopeless cancer patients and contribute funds for their support. Heretofore this organization has emphasized educational campaigns in the prevention and early detection of cancer, contributing to the support of cancer research and clinics throughout the country.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 4, 1944.

Compulsory Social Insurance from the Cradle to the Grave

As pointed out previously in THE JOURNAL, the scheme of the government for a national health service, which has produced the greatest crisis ever faced by the medical profession, is only one phase of the socialistic trend of British politics. The climax—for the present, at any rate—of this trend is the social insurance plan which has just been published. This is the Beveridge scheme, which has been described in THE JOURNAL, with some modifications. It extends compulsory social insurance to the entire population and so includes the millionaire as well as the humblest manual worker. Incidentally, this renders unlikely any favorable action on the demand from the profession that the upper 10 per cent of the population who do not require a national health service should not be included in it. The scheme will cost $3,250,000,000 in the first year, increasing to $4,155,000,000 in 1975. This will be provided by contributions from workers, employers, taxpayers and ratepayers. A Ministry of Social Insurance is to be set up as soon as possible. The main benefits will be as follows:

Sickness: Single man or woman or man with wife earning, $5 a week; man with wife not earning, $8; married woman earning, $3; dependent's allowance, $3.

Invalidity: Single man or woman or man with wife earning, $4; man with wife not earning, $7; married woman earning, $3; dependent's allowance, $3.

Unemployment: Single man or woman or man with wife earning, $5; man with wife not earning, $8; married woman earning, $4; dependent's allowance, $3.

Retirement Pension: Single man or woman or man with wife earning, $4; man with wife not earning, $7; married woman earning, $4.

Family Allowances: $1 a week for each child except the first; more school meals and milk.

Provision is also made for maternity, death, widows and orphans and industrial training.

At present twenty million employed persons are covered by insurance. The new plan, which extends insurance to everybody, will bring in another twenty-seven million. Each insured person will pay in the form of a stamp a single weekly contribution for all the benefits to which he is entitled. For employed men over 18 the total contribution will be $1.50 weekly, of which nearly half will be paid by the employer. This figure includes 12 cents a week which men now pay under a separate industrial injury insurance scheme. The unemployment benefit will be payable for not more than thirty weeks continuously. For employed women the weekly contribution is $1 a week, of which the employer pays more than half.

The government states that its first duty is to protect the country against aggression and the next is to secure the general prosperity and happiness of its citizens. Growth of the national power to produce, with accompanying opportunities for increased well-being, leisure and recreation, must be fostered, it is declared. Plans for the prevention of individual poverty resulting from those hazards of personal fortune over which individuals have little or no control must also be made by the government, it is held. Hence the need for social insurance. The stability of so vast a scheme depends on strict administrative economy in every sense. This is not a matter for the government alone but requires the full cooperation of the public.

FAMILY ALLOWANCES

The proposals for family allowances are based on two principles: that nothing should be done to remove from parents the responsibility of maintaining their children and that it is in the national interest to help parents in discharging that responsibility. The scheme is not intended to provide full maintenance for each child but rather a general contribution to the needs of families with children. The purpose can be best fulfilled by giving a substantial part of the benefit in kind. The present school meals and milk will therefore be extended. It is estimated that this will increase the cost to $300,000,000 a year—a figure which does not fall far short of the total cash allowances to parents. The first child is excluded from the flat rate allowance of $1 a week because it is assumed that one child can be maintained from family earnings.

SICKNESS BENEFIT

Sickness benefit will be payable for the first three years of any continuous period of sickness. After that the lower rate of invalidity benefit will be paid. The government feels that sickness benefits of unlimited duration would be psychologically unwise and would tend to encourage persons subject to recurrent periods of sickness to lapse into chronic invalidity.

RETIREMENT PENSIONS

The prevention of want in old age is a policy on which the government sets great store. Government actuaries have estimated that in the twenty years from 1945 to 1965 the population of pensioners over working age will grow from 3,400,000 to 5,300,000, whereas the number of contributors will be practically stationary at about 21,000,000. In the ten years from 1965 to 1975 there will be a further increase of about 800,000 in the pensioners, while the contributor population will fall by over 1,000,000. These figures are based on the prewar birth and death rates. It may become a matter of vital importance to keep up the national income by encouraging the continuance of productive work by those who have reached the pensionable age. The government therefore proposes that for any one who works beyond the pensionable age and claims his pension later, the benefit rate will be increased by $0.25 weekly for each extra year of work.

CONCLUSION

The government has expressed gratitude to Sir William Beveridge for his great work in preparing his comprehensive and imaginative report. The main tribute is the embodiment of so much of his plan in the proposals, which are believed to afford an adequate basis of social insurance for many years to come. They round off a notable chapter in the history of British social insurance, which since its beginning thirty-three years ago in the National Insurance Act has grown steadily in scope. The present scheme makes provision against every one of the main attacks which economic ill fortune can launch against individual well-being and peace of mind proponents of the plan maintain. They do not explain why the government worked out in detail this revolutionary plan of national compulsory insurance for all persons and for all purposes, from the cradle to the grave, during the greatest of all wars, which for a time placed the very existence of this country in danger. Some explanations are suggested, however. During the war all our activities have been severely controlled, so as to subordinate everything to victory. One result was the abolition of unemployment. So the argument arose "If the government can prevent unemployment in time of war, it can do so in time of peace." After the war of

1914-1918 the country was left to its own devices and there was a period of severe unemployment. The government has now assumed responsibility for dealing with unemployment by prevention or subsidy. In the second place, family allowances are designed to help parents in their responsibility and so encourage parenthood in the face of threatened decline of population.

Home Leave of Soldiers for Parenthood Resented

Much discontent has been caused among men of long service in the Middle East by what they regard as a gross interference with a man's most intimate private affairs. This arises out of publication of an order that married men with more than three years of service in the Middle East could obtain compassionate leave on the grounds that they wanted to return home "to start a family." Within a few days there were more than 1,000 applications. Three weeks later there was an amendment to the original order, which restricted posting to men whose wives were over 35 and who could show good reason why they had not started a family before the war. Wives and husbands were required to produce a medical certificate that they were willing and able to have children. Since this amendment, which makes it difficult for more than a handful of men to obtain posting, in spite of the fact that hundreds had already joyfully written home about the new facility, chaplains and welfare officers have found the men unhappy. What their wives in Britain will think is not difficult to imagine. Most of the soldiers, even the married ones, are willing to serve abroad for three years if necessary, owing to war conditions, but after that they want to go home. Nothing could be worse than the disappointment after hopes were raised by the original order.

BUENOS AIRES

(From Our Regular Correspondent)

Sept. 22, 1944.

Social Care of Patients with Heart Disease

The Department of Social Care to Cardiac Patients in Buenos Aires, of which Dr. Rafael A. Bullrick is the head, has a central department of social assistance and nine dispensaries in the Ramos Mejia, Rawson, Alvear, Pirovano, Durand, Salaberry, Alvares and Tornú hospitals. All the centers are well provided with the necessary means for preventing heart disease and for giving therapy to patients. The work carried on by the department during the last four and a half years is of great importance. The department is supported by the government, but donations are also given by the public. The department gives medical care to ambulatory patients, hospitalization for as long as it is necessary, medical care and guidance to pregnant and nursing mothers with heart disease and to children with heart disease and help in securing proper positions for young people with heart disease. Patients with heart disease who are unable to work and have no family to support them are admitted to institutions in which they will be given the necessary care.

National Department of Public Health

The National Department of Public Health and Social Assistance of Argentina was created Oct. 21, 1943 to supplant the National Department of Public Hygiene. Recently the government changed the functions of the department. From now on all work concerned with public beneficence and social care will be carried on in the Department of Social Assistance, which is a branch of the Secretariat of Work and Public Aid. The functions of the National Department of Public Health are concerned with the prevention and control of diseases. Dr. Eugenio A. Galli, head of the National Department of Public Health, has resigned; Dr. Manuel Augusto Viera has been appointed to the position.

Prevention of Typhoid

Vaccination against typhoid for all persons living in areas in which typhoid is frequent, including children over 3 years of age, became obligatory by a decree of the government which was recently published. A certificate will be given to all persons after vaccination. It should be shown by parents to teachers and by workers to employers. Managers and consulting physicians of working centers will be in charge of demanding the certificate as a requirement for admission to work. Persons who have suffered from typhoid in the recent past and those in poor health can refuse vaccination if they present a medical certificate to the vaccination department. The vaccination and proper medical after-care are given free of charge. The vaccine to be used is that prepared by the National Department of Public Health or any of the vaccines authorized by the National Department of Public Health. Private clientele will pay for vaccination at home. The period of time after which revaccination, either partial or total, is to be administered will be reported later. Infractions of the law will be punished by fines, which will be used to help defray the expenses of the antityphoid campaign. The incidence of typhoid in the Argentine army is negligible because the soldiers are given the vaccines when entering the army. Several cases of typhoid were reported from San Juan shortly after occurrence there of an earthquake in January 1944. Administration of vaccines soon after the cases were reported prevented further spread. The vaccine prepared by the Bacteriologic Institute of Buenos Aires is administered in three progressive doses.

Distribution of Penicillin in Argentina

Penicillin is not available to Argentine physicians; they have to order it from other countries. Penicillin is not produced in this country, although certain scientific institutions and pharmaceutical firms are carrying out laboratory and scientific studies on penicillin. Large amounts of it are to be sent in the near future from the United States to Argentina. No import duty will be charged. The National Department of Public Health appointed a committee in charge of the importation of the drug to Argentina, national distribution of the substance and supervision of prices. The committee sent formularies to physicians for obtaining the amounts of the drug which they may need for their patients.

Marriages

NORMAND EDMOND DUROCHER, Ecorse, Mich., to Miss Audrey Mae Brady of Gulfport, Miss., at Charlotte, N. C., September 3.

MARION AUGUSTUS BALDWIN, Fort Gaines, Ga., to Miss Elizabeth Frances Baldwin of Montgomery, Ala., in September.

GEOFFREY HERMAN BINNEVELD, Leesburg, Fla., to Miss Ellen May Whitt of Yalaha in Charlottesville, Va., September 15.

WILLIAM F. X. CAMPION, Brooklyn, to Miss Marguerita Anita Corrigan of Bay Ridge, N. Y., September 16.

CHARLES ALOYSIUS ROGERS, Upper Montclair, N. J., to Miss Mary P. Robertshaw of Montclair, September 30.

JOHN G. CHESNEY to Miss Audrey Hasler, both of New York, in Montgomery, Ala., September 15.

BROOKE ROBERTS, Bala-Cynwyd, Pa., to Miss Anna W. Ingersoll in Whitemarsh, September 16.

WILLIAM SHERARD CHAPMAN to Miss Lois Elizabeth Smith, both of Florence, S. C., September 16.

JAMES R. FLAHERTY to Miss Kathryn M. Gully, both of Worcester, Mass., August 26.

CHARLES A. DE WERT to Miss Elizabeth L. Dunman, both of Cincinnati, September 14.

RICHARD V. DAUT to Miss Jean Wilkens, both of Muscatine, Iowa, September 28.

CLIFFORD T. SMITH to Mrs. Loine Arthur, both of Houston, August 23.

Deaths

James Addison Babbitt ✱ Haverford, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1898; emeritus professor of clinical otolaryngology at his alma mater and associate professor of otolaryngology at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania; served as professor of hygiene and physical education at Haverford College, becoming emeritus in 1928; member of the United States Football Rules Committee from 1906 to 1925; a fellow and one time president and secretary of the American Laryngological Association; fellow and past president of the American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otological Society; fellow of the American Otological Society, Inc., and the Philadelphia Laryngological Association; fellow and past chairman, executive committee, section on otolaryngology, College of Physicians of Philadelphia; fellow and member of the board of governors of the American College of Surgeons; during World War I served in France and Germany, working with the hospital service of the American Red Cross with the rank of major; specialist certified by the American Board of Otolaryngology; member of the courtesy staffs of the Bryn Mawr Hospital, Bryn Mawr, Presbyterian, Chestnut Hill and Methodist hospitals, Philadelphia; consulting otolaryngologist to the Mercy-Fitzgerald Hospital, Darby, Pa., Children's Hospital of the Mary J. Drexel Home, Children's Hospital, and Misericordia Hospital, Philadelphia; consulting otolaryngologist and acting chief, department of otolaryngology at the Lankenau Hospital, Philadelphia, where he died October 15, aged 74, of cerebral hemorrhage.

Edward Leonard Kickham ✱ Boston; Tufts College Medical School, Boston, 1923; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; member of the New England Obstetrical and Gynecological Society and the Boston Obstetric Society; treasurer of St. Luke's Guild of Physicians; fellow of the American College of Surgeons; since 1930 instructor in gynecology at his alma mater; special lecturer at the Boston College School of Social Work; formerly surgeon of the fire department; served during World War I; senior obstetrician and gynecologist at Carney and St. Elizabeth's hospitals; gynecologist at the New England Medical Center; died in the Cardinal O'Connell House of St. Elizabeth's Hospital August 10, aged 49, of ulcerated colitis.

Denis Lane McAuliffe ✱ North Vernon, Ind.; Miami Medical College, Cincinnati, 1902; formerly instructor in anatomy and lecturer in medicine and materia medica at his alma mater; for thirty years secretary-treasurer and once president of the Jennings County Medical Society; for many years secretary of the Fourth District Medical Society; once president and for fifteen years secretary of the Tri-County Medical Society; member of the Southern Medical Association and the Mississippi Valley Medical Association; at one time county health officer; on the staff of the Schneck Hospital, Seymour, where he died September 18, aged 79, of myocardosis and bronchopneumonia.

Victor Lupu Schrager ✱ Chicago; Universitatea din Bucuresti Facultatea de Medicină, Rumania, 1901; Dearborn Medical College, Chicago, 1904; Rush Medical College, Chicago, 1907; associate professor of surgery at Northwestern University Medical School; professor of surgery at the Cook County Graduate School; formerly assistant professor of surgery at Rush Medical College; a founder member of the American Board of Surgery; a member of the Chicago Surgical Society; fellow of the American College of Surgeons; on the staffs of Mount Sinai, Garfield Park Community, Walther Memorial, Loretto and Cook County hospitals; died October 15, aged 66, of hypertension and heart disease.

Hiram La Mont Youtz, Webster City, Iowa; Johns Hopkins University School of Medicine, Baltimore, 1905; member of the Iowa State Medical Society; during World War I served overseas as a captain in the medical corps of the U. S. Army in command of Field Hospital number 40; honorably discharged in 1919; in 1935 assigned to active status as captain, medical reserve, Civilian Conservation Corps, in Iowa; served as college physician at the South Dakota State College, Brookings, for four years; died September 27, aged 69, of carcinoma of the sigmoid with metastasis to the liver.

Bertis Charles Gwaltney, Fort Branch, Ind.; Indiana University School of Medicine, Indianapolis, 1930; member of the Indiana State Medical Association; health officer of Gibson County; in 1943 appointed assistant collaborating epidemiologist of Indiana; for thirteen years a teacher in various schools in Gibson County, including a year at Wolfe Lake in Northern Indiana, serving as principal at the Mackey High School; a director of the Lynnville National Bank; on the staff of the Gibson General Hospital, Princeton; died August 9, aged 50, of coronary thrombosis.

Arthur E. Bonesteel, Los Angeles; University of Denver Medical Department, 1894; member of the Colorado State Medical Society; formerly on the staff of St. Luke's Hospital in Denver; died July 31, aged 73, of cardiovascular disease.

Samuel Pierson Brush, Babylon, N. Y.; Albany Medical College, 1908; fellow of the American College of Surgeons; died July 5, aged 61, of arteriosclerosis.

Willard James Burns, Washington, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1897; member of the Medical Society of the State of Pennsylvania; died June 28, aged 77, of coronary thrombosis and acute gastritis.

George H. P. Christman, East Washington, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1881; member of the Medical Society of the State of Pennsylvania; served during World War I; died June 24, aged 85, of acute dilatation of the heart, arteriosclerosis and coronary disease.

Leo V. James Conlin, St. Paul; University of Minnesota Medical School, Minneapolis, 1931; health officer of North St. Paul and deputy coroner of Ramsey County; on the staffs of St. John's and St. Joseph's hospitals; died June 10, aged 43, of coronary occlusion.

Edward C. Gager, St. Paul; University of Minnesota College of Medicine and Surgery, Minneapolis, 1905; member of the Minnesota State Medical Association and the Minnesota Dermatological Society; fellow of the American College of Physicians; clinical instructor in dermatology at his alma mater; chief, venereal disease clinic, Wilder Dispensary; attending dermatologist, Ancker Hospital; died in the Bethesda Hospital July 29, aged 61, of acute myocardial failure following an operation for intestinal obstruction due to gallstones in the ileum.

Henry J. Goodwyn, Carrollton, Ga.; Atlanta College of Physicians and Surgeons, 1902; member of the Medical Association of Georgia; president of the Carrollton Federal Savings and Loan Association; died June 24, aged 70, of carcinoma of the liver.

Charles M. Hanby, Wilmington, Del.; Southern Homeopathic Medical College, Baltimore, 1902; member of the Medical Society of Delaware; a member and for many years president of the city board of health; on the staffs of the Memorial, Delaware and Wilmington General hospitals; served as a member of the board of directors of the Alfred I. du Pont Institute of the Nemours Foundation; died July 27, aged 69, of coronary occlusion.

James I. Hembree, Atlanta, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; died in the Crawford W. Long Memorial Hospital July 5, aged 54, of coronary thrombosis.

G. W. Holmsley, Comanche, Texas (licensed by years of practice); died July 8, aged 73.

William Brayton Holt ✱ Oak Ridge, Tenn.; University of Minnesota Medical School, Minneapolis, 1924; member of the Minnesota State Medical Association; formerly on the staff of St. Barnabas Hospital, Minneapolis; died July 26, aged 46, of congestive heart disease, coronary sclerosis and hypertension.

Ernest Walker Irving, Memphis, Tenn.; Meharry Medical College, Nashville, 1897; formerly inspector in city schools for the board of health; died July 18, aged 74, of angina pectoris.

Addison Le Clare Judd, Kanawha, Iowa; Keokuk Medical College, College of Physicians and Surgeons, Keokuk, Iowa, 1902; member of the Iowa State Medical Society; served on the staff of the Lutheran Hospital, Hampton; died July 27, aged 79, of senility.

Christopher C. Kesner, LeRoy, Kan.; Louisville Medical College, Louisville, Ky., 1884; served as local surgeon for the Missouri Pacific Railroad; died June 15, aged 87, of cerebral hemorrhage.

Lucas Allen Miller ✱ Colorado Springs, Colo.; the Hahnemann Medical College and Hospital, Chicago, 1898; first lieutenant in the medical reserve corps of the U. S. Army, not on active duty; died August 21, aged 76, of coronary thrombosis.

James Franklin Owens, Springfield, Mo.; Northwestern Medical College, St. Joseph, 1892; member of the Missouri State Medical Association; formerly lecturer at the Ensworth

Central Medical College; while a resident at St. Joseph, served as president of the board of public health, city health physician and county physician; died August 1, aged 74, of cerebral and gastric hemorrhages.

Edwin N. Reinert ✠ Cleveland, Wis.; Milwaukee Medical College, 1902; died in the Memorial Hospital, Sheboygan, August 1, aged 67, of uremia and carcinoma of the prostate with metastasis.

William T. Rickman, Sapulpa, Okla.; University of West Tennessee College of Medicine and Surgery, Memphis, 1916; died in the Moton Memorial Hospital, Tulsa, June 17, aged 65, of cardiovascular disease.

Frederick Charles Roberts, Easton, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; member of the Medical Society of the State of Pennsylvania; past president of the Northampton County Medical Society; at one time mayor of Easton; emeritus chief of the medical staff of Easton Hospital; died suddenly October 13, aged 74, of cardiac infarct.

Joseph Horace Shull, Stroudsburg, Pa.; Bellevue Hospital Medical College, New York, 1873; also a lawyer; state senator from 1886 to 1890; in 1904 elected to Congress as a representative for a term; served as president of the Monroe County Medical Society and the Monroe County Bar Association; on the staff of the General Hospital of Monroe County, East Stroudsburg; died August 8, aged 95, of uremia.

Marvin R. Smith, Cordele, Ga.; University of Georgia Medical Department, Augusta, 1905; member of the Medical Association of Georgia; died July 12, aged 65, of acute dilatation of the heart.

John Sanders Taylor, Mount Pleasant, Texas (licensed in Texas under the Act of 1907); served as health officer of Mount Pleasant for many years; died June 19, aged 83, of heart disease.

Thomas L. Underwood, Sebastopol, Miss.; Memphis (Tenn.) Hospital Medical College, 1889; died July 27, aged 84, of mitral regurgitation.

Lee Wilbert Wiggins, Doraville, Ga.; Atlanta School of Medicine, 1908; member of the Medical Association of Georgia; served during World War I; on the staff of the Crawford N. Long Memorial Hospital, Atlanta; died in the Veterans Administration, Atlanta, July 20, aged 67, of hypertension and coronary arteriosclerosis, cerebral thrombosis with hemiplegia.

Maurice Houston Wilkinson, Los Angeles; the Hahnemann Medical College and Hospital, Chicago, 1915; formerly professor of internal medicine at the Illinois Post-Graduate Medical School, Chicago; served during World War I; captain, medical corps, Army of the United States, not on active duty; served on the staffs of various Veterans Administration facilities; died August 25, aged 55, of coronary occlusion.

David York Willbern, Runge, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1900; served on the school board for many years; died July 13, aged 73, of lobar pneumonia following a cerebral hemorrhage.

W. Charles Willis, Allentown, Pa.; Eclectic Medical College of the City of New York, 1907; died July 2, aged 67.

Harry M. Wilson, Evans City, Pa.; University of Maryland School of Medicine, Baltimore, 1889; member of the Medical Society of the State of Pennsylvania; vice president of the Citizens National Bank; died July 25, aged 78.

Lieut. Francis J. Broccolo
(MC), U.S.N.R., 1917-1943

Lieut. (jg) Henry B. Landaal
(MC), U.S.N.R., 1918-1944

Capt. Eugene Francis Haverty
M. R. C., U. S. A., 1912-1944

KILLED IN ACTION

Francis Joseph Broccolo, Cicero, Ill.; Loyola University School of Medicine, Chicago, 1941; served an internship at the Cook County Hospital, Chicago, where he had been a resident in otology, laryngology and rhinology; commissioned a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on Jan. 26, 1942; promoted to lieutenant Oct. 1, 1942; had been awarded the Silver Star; killed in action while at sea in the South Pacific area; aged 26; presumptive date of death, Oct. 13, 1943, according to the Navy Department.

Henry Byron Landaal, Waupun, Wis.; Medical College of Virginia, Richmond, 1943; served an internship at the State of Wisconsin General Hospital, Madison; commissioned a lieutenant (jg) in the medical corps, U. S. Naval Reserve on April 6, 1943; killed in action off the coast of France June 9, aged 26.

Eugene Francis Haverty, Pittsburgh; Georgetown University School of Medicine, Washington, D. C., 1938; served an internship at the Mercy Hospital; formerly resident physician at the Children's Hospital, Cincinnati, and the Cincinnati General Hospital; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on June 18, 1938; began extended active duty on July 7, 1941 and assigned to the Station Hospital at Indiantown Gap, Pa.; later promoted to captain; had been stationed in England, Tunisia and Salerno; awarded the Legion of Merit and Silver Star for meritorious service at Anzio beach head; killed in action in Italy, February 29, aged 31.

Bureau of Investigation

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act, and in cases in which they refer to drugs and devices they are designated D.D.N.J. and foods, F.N.J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.]

Hillys "H-R 5."—Morris William Hillinger, trading as Hilly Medicinal Products, Pasadena, Calif. Shipped Oct. 7, 1940. Composition: essentially small amounts of an ephedrine salt, caffeine, sodium phosphate, reducing sugars and water, with caramel coloring. Misbranded because despite the 0.31 grain of ephedrine hydrochloride present in each fluid ounce, the label failed to warn that frequent or continued use might cause nervousness, restlessness or sleeplessness, and that persons suffering from high blood pressure, heart disease or thyroid trouble should not use such drug except on competent advice. Further misbranded because of false and misleading statements in labeling, which represented that the product would be efficacious for use after overindulgence in alcohol, and in the cure, mitigation, treatment or prevention of alcoholism.—[*D.D.N.J., F.D.C. 808; December 1943.*]

Howell's Antiseptic Healing Oil.—Howell Company, Inc., New Orleans. Shipped between Feb. 21, 1940, and Jan. 6, 1941. Composition: essentially an oil containing camphor and 2.4 per cent of phenol. Adulterated because not possessing the phenol strength claimed and not antiseptic as represented by the name. Misbranded because label failed to warn that a bandage should not be used when product was applied to fingers and toes, and that it should be used according to directions and in no case on large areas of the body. Further misbranded because label statement "2% carbolic acid" and claim "Antiseptic" were false and misleading. Also misbranded because of claims on carton that preparation would relieve pain and soreness in carbuncles, erysipelas, boils and itch, and be efficacious for ulcers, old sores and skin eruptions.—[*D.D.N.J., F.D.C. 807; December 1943.*]

Mettozone Tablets.—Standard Drug Company, Inc., Spartanburg, S. C. Shipped Feb. 28 and March 13, 1941. Composition: essentially small amounts of extracts of plant drugs, including nux vomica, and a phosphide of some metal such as zinc. Misbranded because label did not warn against chronic phosphorus poisoning, which might follow the frequent or continued use of a product containing zinc phosphide, or against cantharides, the use of which might cause nausea, vomiting and abdominal pains, and seriously injure the kidneys, hence rendering it hazardous for use by persons afflicted with kidney disease; further misbranded because of false label representations regarding its alleged efficacy in the cure, mitigation, treatment or prevention of sexual debility.—[*D.D.N.J., F.D.C. 805; December 1943.*]

Nomo for Piles, Sanafrio and Asmolac.—Albert B. Hirschman, trading as Hirschman Laboratories and Sanafrio Laboratories, San Pedro, Calif. Shipped between May 14 and July 1, 1940. Composition: Nomo for Piles, essentially benzocaine, boric acid, eucalyptus oil, fixed oils, and zinc oxide; Sanafrio, essentially fat, zinc oxide, camphor and menthol; Asmolac, chiefly water, alcohol, plant extractives, alkaloids, reducing sugars and the iodides of potassium and sodium. Nomo for Piles misbranded because labeling falsely represented product as a competent treatment for all cases of hemorrhoids and as efficacious in relieving soreness and pain in that condition; further misbranded because labeling was misleading in not revealing that the preparation was not a treatment for all cases of hemorrhoids and that competent advice should be obtained in cases of excessive bleeding. Sanafrio misbranded because label falsely represented it as effective in treating chest colds and sore throat. Asmolac misbranded because directions for use mentioned no limitation as to duration of use, and because, though it contained iodine or iodides and the alkaloids of belladonna and hyoscyamus, the labels failed to warn that the product should be used with caution in the presence of certain conditions; further misbranded because directions falsely represented that, when used as directed in asthmatic spasms, it often would completely prevent these; also misbranded because labels did not declare the name and quantity or proportion of alkaloids of belladonna and hyoscyamus present.—[*D.D.N.J., F.D.C. 757; September 1943.*]

Re-Duce-Olds Capsules.—American Medicinal Products, Inc., Los Angeles. Shipped between April 7 and June 9, 1941. Composition: essentially a mixture of thyroid and potassium iodide (0.5 grain and 0.92 grain, respectively, per capsule), phenolphthalein and milk sugar. Misbranded because of false label representation that the mixture was an adequate and appropriate treatment for obesity.—[*D.D.N.J., F.D.C. 783; September 1943.*]

Sani✚Cross Adhesive Strips and Tip Top Emergency First Aid Kits.—Gero Products, Inc., South Boston, Mass. Shipped Jan. 27 and April 28, 1942. The Strips were adulterated because purity and quality fell below that which they purported to possess as being supposedly suitable for use on cuts and other wounds. Misbranded because falsely represented to be thus suitable. The Kits were adulterated because the absorbent cotton that they contained was not sterile but was contaminated with living bacteria, and hence fell below the standard of the United States Pharmacopeia. Misbranded because claims "First Aid Kit . . . For small cuts . . . Be Prepared for Emergencies" were false and misleading when applied to kits containing items which were not sterile. Further misbranded in that labels did not accurately declare quantity of contents, and containers were so made and filled as to be misleading.—[*D.D.N.J., F.D.C. 795; September 1943.*] Another consignment of Sani ✚ Cross Adhesive Strips shipped by World Merchandise Exchange, New York, Oct. 9, 1941, was declared adulterated and misbranded for essentially the same reasons as those named above and reported under a separate Notice of Judgment 797.

Wise's Kollesol Tablets.—Wise's K. C. Homeopathic Pharmacy, Kansas City, Mo. Shipped Jan 22, 1942. Composition: essentially oxyquinoline sulfate, potassium sulfate and lactose. Misbranded because labeling falsely represented that product would eliminate bacteria, guard against toxins and ptomaines, promote healing, provide healthy granulation with a minimum of scar tissue, control hemorrhage, prevent diphtheria and other infections, external and internal, and provide adequate medication in dentistry for toothache, pyorrhea, trench mouth, gingivitis and ulcerations, as well as diseases of the eye, ear, nose and throat, the genito-urinary tract and skin conditions including varicose ulcers, carbuncles, erysipelas, athlete's foot and some other things.—[*D.D.N.J., F.D.C. 789; September 1943.*]

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Right of Drugless Practitioner to Perform Hemoglobin Test.—The Board of Medical Examiners of California issued a "Drugless Practitioner's certificate of license" to King authorizing him to practice as a drugless practitioner. Subsequently an accusation was filed with the board, charging that King was guilty of unprofessional conduct in that on a stated day he penetrated the tissues of a stated patient in the treatment of a certain physical condition, that he had on stated occasions prescribed or administered drugs and that he had unlawfully used the title "doctor" or the prefix "Dr." After hearing, the board found the charges sustained and revoked King's license to practice. King then brought mandamus proceedings to review the order of revocation. The trial court found that the evidence warranted a finding of guilt only with respect to the unprofessional conduct in the charge that King had unlawfully used the title "doctor." This violation, the trial court held, however, was so trivial as to be insufficient to support the order of revocation entered by the board, and the trial court accordingly ordered that King's license should be suspended for six months only. King then appealed to the district court of appeal, first district, division 2, California.

The first count of the accusation filed with the board charged King with unprofessional conduct in that he did on a date specified "penetrate the tissues of" a stated patient "in the treatment of a certain disease, injury, deformity and other physical and mental conditions" in violation of the laws of the state relating to the practice of the healing arts. The evidence to support that charge was to the effect that King made a hemoglobin test of the blood of the person named, at a lecture that he was giving, by taking a drop of blood from the earlobe of that person, using what was vaguely described as "a long instrument similar to a pencil." He then compared the drop of blood so taken with a hemoglobin chart and told the person what the reading showed. No charge was made for the test. The question is thus presented, said the appellate court, as to whether or not the action of King constituted a penetration of the tissues within the intendment of that section of the Business and Professional Code which states that the penetration of the tissues of any human being by the holder of a drugless practitioner's certificate in the treatment of any physical or mental condition constitutes unprofessional conduct. In the opinion of the court, King's action in this respect constituted diagnosis, a procedure he was lawfully permitted to perform in view of the fact that among the educational requirements imposed on an applicant for a license to practice as a drugless practitioner is a requirement that he shall have taken at least a five hundred hour course in diagnosis in his so-called professional school and

in view of the fact that "even in the case of drugless practitioners," as said by the Supreme Court of California in *People v. Jordan*, 172 Calif. 391, 156 P. 451, "Intelligent treatment may only follow correct diagnosis." The court also alluded to the fact that among the questions propounded in the examinations given applicants for licenses to practice as drugless practitioners are questions calling for the description of the Dick test and the Schick test. The court finally pointed out that the section prohibiting drugless practitioners to penetrate the tissues merely prohibits the penetration of the tissues "in the treatment of a disease . . . or other physical or mental condition . . ." and that there was no evidence presented that King's action came within the language of this section. The court was of the opinion that King's action in taking the hemoglobin test did not come within the letter or spirit of the law.

The second count of the accusation filed with the board charged unprofessional conduct on the part of King in that he did "prescribe, use or administer drugs or what are known as medicinal preparations, to wit: 'Gland' capsules, 'Min-a-rex' and 'Vitamin' capsules . . . in the treatment of a disease, deformity or other physical condition." The members of the board were unanimous in voting that with respect to this count King was guilty as charged. This was done, said the appellate court, notwithstanding the fact that no evidence was offered relative to the use or prescription of any "gland capsules," and that the undisputed evidence showed that the other compounds were *not* used "in the treatment of a disease, deformity or other physical condition." In the proceeding before the board to show that these compounds were "drugs or what are known as medicinal preparations," a state chemist testified before the board as to his chemical analysis of the contents of the mixture and concluded with the statement that "Min-a-rex" was "probably sea water or something of a similar composition." The undisputed evidence was that the "Vitamin Capsules" were food substitutes containing "wheat germ oil" and were sold by King in the original sealed package under the trademark of the manufacturer without other representation than what was printed on the label. No evidence was introduced to prove that they were prescribed or used for the purposes denounced in the code, namely, "in the treatment of any . . . physical or mental condition of the human being." Further, as indicative that there was a complete failure of proof of the charges made in this count, the court noted that the board denied King the right to present evidence of two essential elements of his defense, namely, that no drugs or medicines were used in the treatment of any disease or physical condition and that the packages sold met the requirements of the pure food laws of the United States and of the state. If King had been permitted to make this proof, the court concluded, no reasonable person could have found him guilty of a charge of using drug or medicinal preparations in the treatment of any physical or mental condition and the denial of that right was arbitrary, unreasonable and a breach of discretion on the part of the board.

The third count of the accusation filed with the board charged King with violating section 2409 of the Business and Professions Code, which reads as follows:

> Unless a person *licensed* and authorized under this chapter or any preceding medical practice act *to use* the title "doctor" or the letters or prefix "Dr." holds a physician's and surgeon's certificate, the use of this title or these letters or prefix *without further indicating the type of certificate he holds*, constitutes unprofessional conduct within the meaning of this chapter.

The accusation, said the court, does not allege that King was "licensed" under any act "to use the title 'doctor' or the letters or prefix 'Dr.'" The license was not offered in evidence. The accusation filed with the board alleged and the answer admitted that King was issued a "Drugless Practitioner's certificate of license" authorizing him to practice as a drugless practitioner. It does not appear either in the statute or in the record that such license authorized King to use the title "doctor" in any form. The purpose of the statute is clear. If a person is licensed under any medical practice act to use the word "doctor" in relation to a profession other than that of physician or surgeon, he must indicate the type of certificate he holds. The court was unable to find any provision in the law or of any "preceding medical practice act" which authorizes any agency to license a drugless practitioner to use the word "doctor" or the prefix "Dr." and, unless such a license has been issued, the court held the section does not apply. It seems apparent, said the court, that the purpose of the section was to prevent misrepresentations and fraud and that there was no intent to appropriate these titles to the exclusive use of those who held the certificate of a physician or surgeon. Thus we have doctors of medicine, doctors of philosophy and many other types of "doctors" who are not licensed under any medical practice act and therefore not included in this section.

The court accordingly held that the revocation of King's license was not warranted. The court further held that the trial court had erred when it ordered the suspension of King's license. By the terms of the Business and Professions Code, said the court, all disciplinary action with respect to physicians and surgeons and drugless practitioners is lodged with the board of medical examiners, and a court reviewing the orders of the board is without power to substitute its discretion for that of the board in the matter of the form of discipline to be imposed. The appellate court in effect reversed the order of the board of medical examiners revoking King's license to practice.—*King v. Board of Medical Examiners, 151 P. (2d) 282 (Calif., 1944).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and of Examining Boards in Specialties were published in THE JOURNAL, October 28, page 589.

BOARDS OF MEDICAL EXAMINERS

ALASKA: Juneau, March. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARKANSAS: * Little Rock, Nov. 9-10. Sec., Dr. D. L. Owens, Harrison.

CALIFORNIA: *Oral.* San Francisco, Nov. 15. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

CONNECTICUT: * *Medical. Written.* Hartford, Nov. 14-15. *Endorsement.* Hartford, Nov. 28. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, Nov. 14-15. Sec., Dr. J. H. Evans, Hartford 6.

DISTRICT OF COLUMBIA: * Washington, November. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: * Jacksonville, Nov. 20-21. Sec., Dr. Harold D. Van Schaick, 2736 S.W. Seventh Ave., Miami 36.

IDAHO: Boise, Jan. 8-11. Dir., Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Bldg., Boise.

INDIANA: Indianapolis, Jan. 3-5. Exec. Sec., Board of Medical Registration and Examination, Miss Ruth V. Kirk, 301 State House, Indianapolis 4.

MAINE: Portland, Nov. 14-15. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MARYLAND: *Homeopathic.* Baltimore, Dec. 1-3. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 14-17. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

NEVADA: Carson City, Nov. 6. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NORTH DAKOTA: Grand Forks, Jan. 2-5. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

SOUTH CAROLINA: Columbia, June 25-27. Sec., Dr. N. B. Heyward, 1329 Blandina St., Columbia.

SOUTH DAKOTA: * Pierre, Jan. 16-17. Sec., Medical Licensure, State Board of Health, Dr. G. Cottam, Pierre.

TEXAS: Dallas, Nov. 15-17 and Dec. 19-21. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas 2.

VERMONT: Burlington, June. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: * Richmond, June 20-23. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WASHINGTON: * Seattle, Jan. 15-17. Dir., Department of Licenses, Mr. Thomas A. Swayze, Olympia.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, Dec. 6-7. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

IOWA: Des Moines, Jan. 9. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

NEW MEXICO: Santa Fe, Feb. 12. Sec., Miss Marion M. Rhea, State Capitol, Santa Fe.

RHODE ISLAND: Providence, Nov. 15. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Aberdeen, Dec. 1-2. Sec., Dr. G. M. Evans, Yankton.

TENNESSEE: Memphis and Nashville, Dec. 18-19. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

WISCONSIN: Milwaukee, Dec. 2. Sec., Prof. R. N. Bauer, 152 W. Wisconsin Ave., Milwaukee 3.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Physiology, Baltimore

141:613-750 (July) 1944

Factors Responsible for Intestinal Phase of Gastric Secretion. W. D. Beamer, M. H. F. Friedman, J. E. Thomas and M. E. Rehfuss.—p. 613.
Some Factors Affecting Resistance of Ejaculated and Epididymal Spermatozoa of Boar to Different Environmental Conditions. J. F. Lasley and R. Bogart.—p. 619.
Comparison of Direct and Indirect Blood Pressure Measurements in Rats. R. H. Shuler, H. S. Kupperman and W. F. Hamilton.—p. 625.
Lactate Response to Exercise and Its Relationship to Physical Fitness. F. Crescitelli and C. Taylor.—p. 630.
Effect of Some Internal Factors on Human Work Output and Recovery. E. E. Foltz, F. T. Jung and Lillian E. Cisler.—p. 641.
Effect of Manganese Intake on Concentration of Bisulfite Binding Substances in Blood. J. T. Skinner and J. S. McHargue.—p. 647.
Response to Chilling and Recovery in Adrenalectomized Cats. F. A. Hartman and Katharine A. Brownell.—p. 651.
Metabolism of Acetone Bodies and Glucose in Vitro and Effect of Anterior Pituitary Extract. R. A. Shipley.—p. 662.
Kidney as Locus of Fructose Metabolism. R. M. Reinecke.—p. 669.
Effect of Blood Withdrawal and Replacement on Bleeding Volume of Normal Dogs Under Barbital Anesthesia. H. Lawson.—p. 677.
Effects of Excitement, of Epinephrine and of Sympathectomy on Mitotic Activity of Corneal Epithelium in Rats. J. S. Friedenwald and W. Buschke.—p. 689.
Determination of Blood and Plasma Volume Partitions in Growing Rat. J. Metcoff and C. B. Favour.—p. 695.
Effects of Nembutal and Yohimbine on Chronic Renal Hypertension in Rat. Racheal K. Reed, L. A. Sapirstein, F. D. Southard Jr. and E. Ogden.—p. 707.
Plasma, Gelatin and Saline Therapy in Experimental Wound Shock. W. W. Swingle and W. Kleinberg.—p. 713.
Circulatory Collapse Following Mechanical Stimulation of Arteries. R. F. Rushmer.—p. 722.
Secretion of Pancreatic Juice After Cutting Extrinsic Nerves. J. O. Crider and J. E. Thomas.—p. 730.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

52:123-244 (Aug.) 1944

Effect of Roentgen Rays on Minute Vessels of Skin in Man. E. P. Pendergrass, P. J. Hodes and J. Q. Griffith.—p. 123.
*Determination of Placental Site in Bleeding During Last Trimester of Pregnancy. J. J. McCort, C. N. Davidson and H. J. Walton.—p. 128.
Nonsecreting Cysts of Maxillary Sinuses, with Special Reference to Roentgen Aspects and Diagnosis of Large Types. J. W. Grossman and H. D. Waltz.—p. 136.
Postoperative Emphysematous Bullae Following Lung Abscess. W. R. Oechsli.—p. 145.
Difficulties in Roentgenologic Examination of Biliary Tract. A. J. Bengolea, C. V. Suarez and A. Negri.—p. 149.
*March Fracture: Analysis of 166 Cases. F. H. Tyner and W. T. Hileman.—p. 165.
Roentgenographic Studies of Cervical Spine. L. A. Hadley.—p. 173.
Effect of Increased Intraspinal Pressure on Movement of Iodized Oil Within Spinal Canal. B. S. Epstein.—p. 196.
Osteoid-Osteoma of Head of Radius: Case Report. H. M. Stauffer.—p. 200.
Military Roentgenologic Training. H. G. Moehring.—p. 203.
Wartime Graduate Medical Meetings. E. L. Bortz.—p. 205.
Simple Method for Measuring Peak Voltage in Diagnostic Roentgen Equipment. R. H. Morgan.—p. 208.

Determination of Placental Site in Bleeding During Pregnancy.—McCort and his associates review roentgenologic studies on 132 patients with the presenting symptom of bleeding during the last trimester of pregnancy. The accuracy of this method of examination was 87.8 per cent, with best results in the group diagnosed as negative for placenta previa (97 per cent). The roentgen examination for placenta previa has proved to be a valuable adjunct to the sterile pelvic examination. The two examinations are somewhat complementary. The former enables the obstetrician to treat bleeding cases with greater exactitude. A soft tissue roentgenographic study of the abdomen is first made. If, after careful study, the main portion of the placenta is found to lie in the fundus, it is reported as negative for placenta previa and no further examination is made. If the placenta is not visualized in this position, an air cystogram is done to determine if there is any tissue intervening between the fetal head and the bladder wall. The following signs are of value in positive diagnosis of placenta previa: (*a*) failure to visualize the placenta in the body of the uterus; this suggests central placenta previa; (*b*) location of mass of placenta below the equator of the uterus; (*c*) widening of sacral promontory-fetal head distance when the placenta is implanted on the anterior wall; (*d*) widening of symphysis pubis-fetal head distance when the placenta is implanted on the anterior wall; (*e*) widening of the vesicocephalic distance seen after pneumocystography; (*f*) lateral displacement of the bladder seen after pneumocystography; (*g*) displacement of the fetal head from the midcoronal and sagittal planes.

March Fracture.—Tyner and Hileman observed between April 1941 and June 1943 166 cases of march fracture of the metatarsal bones. All current theories concerning the production of march fractures give due importance to the small repeated traumas incurred in long marches, but all authors agree that some other factor must be involved. "Physiologically inadequate" feet, abnormal length of metatarsals, overload, neurogenic influences, inflammatory processes and the handicap of a previously sedentary occupation of the patient have been mentioned as possible causative factors. The authors evaluated these possible causes in their cases. The most frequent site of fracture was at the distal third of the third metatarsal. The age distribution appears closely correlated to the age distribution in the Army and is therefore not considered of significance in the etiology. No neurologic disturbances or infections could be discovered. Prior occupation and length of service were studied in 20 cases. The duration of training time spent taking long hikes and forced marches averaged twenty-seven weeks. The patients' former occupations ranged from coffin making to dress designing and did not appear of significance. The 20 men who were interviewed personally reported that they had completed several miles of marching and that muscle fatigue had set in before the onset of symptoms. Studies on the blood chemistry of 12 patients revealed that the serum phosphatase levels averaged 6.48 units. This slight increase may be due to the stimulus of healing fractures. It is apparent from these studies that age, previous occupation, neurologic disturbances, bony anatomy of the feet and bone metabolism cannot be important etiologic factors. The authors think that due consideration has not been given to the fact that bones cannot stand great stresses unless they are adequately supported by muscles. When muscles of the foot and leg are fatigued, the weight of the body is thrown directly on the metatarsal bones, while the arches are flattened by the loss of muscular tone. All of the 20 men concerning whom information was available experienced fatigue before the pain of fracture occurred. This makes the authors believe that muscle fatigue as it occurs during long marches is the principal cause of march fractures.

American Journal of Surgery, New York

65:153-302 (Aug.) 1944

*Functional Parathyroid Tumors and Hyperparathyroidism: Clinical and Pathologic Considerations. H. B. Alexander, J. de J. Pemberton, E. J. Kepler and A. C. Broders.—p. 157.
Management of Postoperative Urinary Tract Complications. E. E. Ewert and H. A. Hoffman.—p. 189.
Motion Study in Surgery. F. B. McCarty.—p. 197.
*New Technic for Instilling Amniotic Fluid Concentrate Intra-Abdominally at Close of Operations: 27 Case Reports. H. J. Merkle.—p. 210.
Fractures of Femur: Results of Treatment of 179 Patients. H. A. Swart and G. Miyakawa.—p. 221.
Effects of Sulfanilamide and Azochloramid on Hemolytic Streptococci and Staphylococci in Wounds of Rabbits. E. R. Neter, R. S. Hubbard and T. G. Lamberti.—p. 226.
Benign Tumors of Stomach. E. B. Dewey.—p. 233.
Psychology of Patient Undergoing Plastic Surgery. A. J. Barsky.—p. 238.
Fractures of Jaw: Analysis of 212 Cases. W. A. Coakley and J. M. Baker.—p. 244.
Treatment of Fractures with Haynes Splint. M. K. King.—p. 248.
Use of Curare in Anesthesiology. L. Watter.—p. 253.

Parathyroid Tumors and Hyperparathyroidism.—Alexander and his associates present the histories of 14 instances of hyperparathyroidism due to functioning parathyroid tumors which were treated at the Mayo Clinic up to November 1942.

In 2 cases there was fatal termination, while in 12 the results of operative treatment were excellent. The authors stress the widely divergent clinical pictures which may be presented by patients with hyperparathyroidism. No single symptom or sign should be regarded as decisive. Single findings of concentrations of calcium less than 12.5 mg. per hundred cubic centimeters of serum were encountered in 4 of the 14 cases of proved hyperparathyroidism. The authors stress the importance of the relation between the serum protein level and the serum calcium level. Depression of the value for serum phosphorus, measured as inorganic phosphate, is the rule in cases without gross impairment of renal function. The serum alkaline phosphatase level is elevated in proportion to the degree of involvement of bone. The Sulkowitch test provides a rough estimate of the presence or absence of excess urinary excretion of calcium. Considered alone it is not diagnostic of hyperparathyroidism. Bone changes in hyperparathyroidism appear to be an index more of the duration of the disease than of its severity. The incidence of renal lithiasis in hyperparathyroidism is about 60 per cent. In 13 of the 14 cases the tumor showed cytologic evidence of cancer. No correlation was found to exist between the weight of the tumor and the degree of hyperparathyroidism as measured by the concentration of calcium in the serum before operation. The average weight of the tumors was 18.2 Gm. They were encapsulated and usually were brown. Four were in the mediastinum, 3 being posterior and 1 anterior. Cytologic evidence of cancer was seen in chief cells, oxyphil cells and foam cells. Such evidence included irregularity of size and staining power of the nuclei, a densely staining chromatin network, giant nuclei, mitotic figures, pathologic mitoses, prominent nucleoli, irregular cellular arrangement and invasion of the capsule and blood vessels by tumor cells. The type of cell predominating in the tumor did not appear to affect the clinical picture. The authors stress the necessity of complete operative removal of parathyroid tumors.

Instilling Amniotic Fluid at Close of Operations.—Merkle points out that one of the chief functions of amniotic fluid in its natural location is to prevent adhesions between the amniotic sac and the fetus. He describes 27 abdominal operations in which amniotic fluid concentrate was instilled intra-abdominally immediately before the peritoneum was closed. Instillation in the first 8 cases was attempted by the funnel and catheter method, the fluid reaching the peritoneum by gravity. In the remaining cases the fluid was instilled through a specially designed trocar, positive pressure being substituted for gravity. The latter method proved preferable.

Annals of Allergy, Minneapolis

2:281-364 (July-Aug.) 1944

Qualitative Differences Among Canine Danders. S. B. Hooker.—p. 281.
Histopathology of Eczematoid Dermatoses. W. Sachs, C. S. Miller and Margaret Gray.—p. 289.
Precipitation of Pulmonary Edema by Overdose of Antigen in Patient with Rheumatic Mitral Disease. K. J. Deissler.—p. 299.
*Psychiatric Studies in Clinical Allergy. E. A. Brown and P. L. Goitein.—p. 303.
Pollination of Anemophilous Trees in New Orleans. W. T. Penfound.—p. 315.
Severe Urticarial Reactions Due to Pooled Human Plasma: Report of Case. B. Dickstein.—p. 327.
Contact Dermatitis from Rubber Gas Mask. J. C. Gilbert.—p. 339.
Subcutaneous Emphysema During Asthma. M. Francis.—p. 342.
Localized Atrophy of Subcutaneous Fat After Repeated Injections of Grass Pollen. N. Francis.—p. 344.

Psychiatric Studies in Clinical Allergy.—Brown and Goitein discuss the psychiatric components of allergic personality. The authors demonstrated the existence of a special type of personality prone to asthmatic attacks. A sample population of asthmatic subjects and an equal number of nonasthmatic allergic subjects were classified for normal personality variables. The asthmatic patient had a somewhat greater tendency than the normal to be left handed and to marry and was subject to emotional instability when compared either with other allergic patients or with the normal population of the same age and social group. All the patients seem to be of average intelligence; but in 43 per cent the personality deviated from the normal and showed trends constituting abnormal or psychiatric personalities. The abnormal aspects of personality were now tested for by an independent technic. The neurotic elements of deviation were determined separately by a psychiatric assessment of the patient and his background. This gave a score which indicated the degree of severity of the attendant neuroses. Psychiatric inquiries differentiated an abnormal personality of a special stamp (obsessive and paranoid). Neurotic and emotional maladjustment was discernible in 43 per cent of the asthmatic subjects as compared with 10 per cent in the control patients and 47 per cent in the allergic nonasthmatic subjects. Current neuroses were diagnosed in 20 per cent of the patients. The neuroses in allergic nonasthmatic patients totaled 16 per cent. These neuroses took the form of hypochondriasis, obsessionalism, conversion and anxiety-hysteria and (among the allergic nonasthmatic patients) vague anxiety symptoms, depression, obsessionalism and hysteria. In both groups the emotionally stable section admitted to a feeling of improvement as a result of physical treatment and seemed less inclined to mental resistance and obstinancy. They lacked the sense of dissatisfaction which was noted in the unstable section. The hysteroid type was more evident in the allergic neurotic patients and the obsessive type among the asthmatic neurotic patients.

Archives of Dermatology and Syphilology, Chicago

50:79-150 (Aug.) 1944

Contact Testing of Buccal Mucous Membrane for Stomatitis Venenata. L. Goldman and B. Goldman.—p. 79.
Ichthyosiform Atrophy of Skin in Hodgkin's Disease: Report of Case, with Reference to Vitamin A Metabolism. A. J. Glazebrook and W. Tomaszewski.—p. 85.
Rat Mite Dermatitis: Acariasis Caused by Tropical Rat Mite, Liponyssus Bacoti Hirst, 1914. C. R. Anderson.—p. 90.
Tuberous Sclerosis: Report of Case. Z. B. Noon and O. O. Williams.—p. 96.
Kaposi's Varicelliform Eruption: Review of Literature and Report of 2 Cases of Its Occurrence in Adults. R. L. Barton and L. A. Brunsting.—p. 99.
Juxta-Articular Nodules. H. D. Chambers.—p. 105.
Impetigo Herpetiformis in Male: Report of 1 Case with Response to Sulfapyridine. A. F. Hall.—p. 107.
Prurigo of Hebra (Severe Type). B. Kanee.—p. 113.
Superficial Epitheliomatosis: Report of Case. S. L. Weisman and L. S. Medalia.—p. 117.
Lichen Sclerosus et Atrophicus: Report of Its Occurrence in Negro. S. Irgang.—p. 120.
Contact Dermatitis Produced by Tincture of Merthiolate. L. Hollander.—p. 123.

Archives of Internal Medicine, Chicago

74:1-80 (July) 1944

*Treatment of Scarlet Fever. M. J. Fox and N. F. Gordon.—p. 1.
Recovery from Multiple Rheumatoid Arthritis Complicated by Amyloidosis in Child: Report of Case and Review of Literature. A. Trasoff, N. Schneeberg and M. Scarf.—p. 4.
Actinomycosis of Heart Simulating Rheumatic Fever: Report of 3 Cases of Cardiac Actinomycosis, with Review of Literature. A. Cornell and H. B. Shookhoff.—p. 11.
Sickle Cell Disease: I. Observations on Behavior of Erythrocytes in Sickle Cell Disease. R. C. Murphy Jr. and S. Shapiro.—p. 28.
Blood: Review of Recent Literature. F. H. Bethell, C. C. Sturgis, O. T. Mallery Jr. and R. W. Rundles.—p. 36.

Treatment of Scarlet Fever.—Three types of therapy for scarlet fever are available: (1) chemotherapy with sulfonamide compounds, (2) administration of commercial antitoxin and (3) administration of convalescent serum. Fox and Gordon evaluate these methods in an analysis of results obtained in 7,500 scarlet fever patients hospitalized at the South View Hospital in Milwaukee during the years between 1937 and 1943. Sulfonamide compounds find their chief value in the treatment of certain complications. These drugs are of no value in the management of the toxic phase or type of scarlet fever. The use of commercial antitoxin, prepared with horse serum, combats the toxic phase of the disease but introduces the danger of foreign protein reactions. Pooled human convalescent serum produces rapid clinical response and offers the best means of therapy. Of the 7,500 patients, 1,000 had received pooled human convalescent serum. To evaluate the effect of serum therapy, 1,000 consecutive cases were chosen from the hospital records for comparison. These control cases were deliberately selected from the year 1923, when only symptomatic treatment could be used, since antitoxin, convalescent serum and sulfonamide com-

pounds were not then available. The series of 1,000 patients of 1937 to 1943 contained a far higher percentage of seriously ill persons than did the 1,000 patients of 1923. Eighty-eight and six tenths per cent of the patients treated with serum were severely ill, in contrast to only 20.3 per cent of the control series. Notable beneficial effects of pooled convalescent serum included prompt subsidence of fever, alleviation of signs and symptoms, avoidance or improvement of complications, shortened period of hospitalization and lower mortality rate. The last mentioned consideration is especially significa ' in view of the fact that the lower mortality rate was obtained in a group of patients who were more severely ill. Smaller doses of convalescent serum than have been previously used have been found to be effective.

Archives of Neurology and Psychiatry, Chicago

52:87-162 (Aug.) 1944

Clinical and Pathologic Features of Gliomas of Spinal Cord. H. A. Shenkin and B. J. Alpers.—p. 87.
Effects of Stimulation and Lesion of Median Longitudinal Fasciculus in Monkey. M. B. Bender and E. A. Weinstein.—p. 106.
Effect of Insulin Hypoglycemia on Glycogen Content of Parts of Central Nervous System of Dog. Annette Ghesler and H. E. Himwich.—p. 114.
Photic Driving. A. E. Walker, J. I. Woolf, W. C. Halstead and T. J. Case.—p. 117.
Post-Traumatic and Histamine Headache. A. P. Friedman and C. Brenner.—p. 126.
Multiple Transfusions for Schizophrenia. A. Z. Pfeffer and M. J. Pescor.—p. 131.
Spinal Cord Level Syndrome Following Intrathecal Administration of Magnesium Sulfate for Tabetic Crisis: Report of Case, with Necropsy. S. A. Guttman and A. Wolf.—p. 135.
Rapid Head Movement Test of Equilibratory Function. G. H. Hyslop.—p. 140.

Archives of Otolaryngology, Chicago

40:75-156 (Aug.) 1944

Labyrinthitis Due to Pneumococcus Type III: Histopathologic Studies. F. Altmann and J. G. Waltner.—p. 75.
Histopathology of Nasal Mucosa of Older Persons. A. R. Hollender.—p. 92.
*Ménière's Syndrome: Results of Treatment with Nicotinic Acid in Vasoconstrictor Group. M. Atkinson.—p. 101.
*Hereditary Hemorrhagic Telangiectasia (Osler's Disease): Review of Literature and Report of Cases. M. F. Stock.—p. 108.
*Vitamin C-Sulfonamide Compounds in Healing of Wounds: Use of Sulfanilamide Ascorbate in Treatment of Chronic Suppuration of Wound After Radical Mastoidectomy. S. L. Ruskin.—p. 115.
Epistle on Organs of Hearing by Bartholomaeus Eustachius: Dedicated to Francis Alciatus, Bishop of Milan During Reign of Pope Pius IV. G. O. Graves and M. E. Galante.—p. 123.
Carcinoma of Larynx: Review of Treatment and End Results at Brooklyn Cancer Institute. W. E. Howes and M. Platau.—p. 133.
Tumors of Nose and Throat. G. B. New and E. L. Foss.—p. 142.

Ménière's Syndrome.—Atkinson maintains that in cases of idiopathic Ménière's syndrome one of two vascular mechanisms is at work, a primary vasodilator and a primary vasoconstrictor mechanism. These two groups can be differentiated by means of an intradermal test with histamine. The treatment appropriate to one group is inappropriate and deleterious to the other. Therefore accurate grouping is a prime requisite for effective therapy. The satisfactory results obtained by desensitization to histamine in the primary vasodilator group have already been published. This paper is concerned with the treatment in the primary vasoconstrictor group. The series reviewed comprises 110 patients observed between January 1940 and June 1943. All have been under personal observation. They have the idiopathic syndrome, they were proved to be insensitive to histamine and thus belong to the primary vasoconstrictor group. The author found nicotinic acid to be the most effective vasodilator drug. Its action is at the periphery of the vascular system. This distal effect is wanted, since it is the circulation in the capillaries of the stria vascularis which is believed to be at fault in this condition, at least as far as concerns the aural manifestations. It is essential to use nicotinic acid, not nicotinamide. Whereas the two substances are interchangeable as regards their vitamin effect, they are not interchangeable as regards vasodilator effect. The most efficacious method is to start with injections and gradually wean the patient to oral medication. The author discusses the indications for the intravenous, the intramuscular and the oral medication. The 110 patients were treated medicinally exclusively with nicotinic acid. The attacks of vertigo were relieved or greatly modified in 84 per cent of the cases.

Hereditary Hemorrhagic Telangiectasia (Osler's Disease).—Stock defines hereditary hemorrhagic telangiectasia as a rare disease, probably due to mesenchymal dysplasia, which is characterized by the presence of multiple acquired angiomas or telangiectasis of varying distribution and number with a tendency to bleed spontaneously or from slight trauma. It is transmitted as a dominant characteristic. The initial symptom usually consists of abnormally profuse epistaxis beginning at about puberty. This is followed by the development of multiple telangiectasias of the skin and mucous membranes from the age of 25 to 35. All symptoms tend to reach their greatest severity during the fourth decade. The author presents a review of the literature from 1933 to 1944 and adds 7 cases, which were gathered during the past two and a half years in his own otolaryngologic practice. In about 20 per cent of the recorded cases the disease probably developed in the absence of a family history. Whether these patients can transmit the disease to their progeny is not known. The author adds to the literature the third recorded instance in the last eleven years in which the disease can be traced through six generations in one family. The extreme rarity of this, together with the fact that the disease has become progressively milder during the last two generations in this family, suggests self limitation of the hereditary transmission. The disease is generally regarded as simple ectasia of preexisting vascular channels, but it is not improbable that the lesions are actually multiple acquired neoplastic angiomas arising from endothelial rests of embryonal origin. This is suggested by the following observations: Epistaxis usually predates the development of visible mucosal or cutaneous lesions; satellite lesions develop in the region adjoining the site formerly occupied by angiomas destroyed by treatment; the lesions have a universal distribution and some are of great size; they have a tendency to disappear spontaneously while new angiomas appear; the microscopic and biomicroscopic pictures suggest neoplastic development; there is a slow and incomplete but definite response to roentgen therapy. The newer methods of treatment include electrolysis, roentgen or radium irradiation, microinjection of sclerosing solutions and parenteral administration of moccasin venom. The author observed good results in the single patient who was treated with roentgen rays by the "intermediate" method. The literature includes many references to a possible relationship between Osler's disease and other diseases due not only to possible mesenchymal but also to possibly associated ectodermal dysplasia. These postulates have not been proved. The author thinks that more widely disseminated knowledge of the disease will result in its more frequent recognition and diagnosis.

Vitamin C-Sulfonamide Compounds in Healing of Wounds.—Ruskin reviews the literature on the role of vitamin C in the healing of wounds. He believes that the local effect of the ascorbic acid is independent of the systemic level of vitamin C. Vitamin C locally applied to wound tissue presents an additional factor in healing. The relationship of ascorbic acid to the bacteria in the wound area has been investigated, and the conclusion has been reached that ascorbic acid serves as a detoxicating agent. The possibility of using vitamin C in chemical combination with the sulfonamide drugs opened up a most interesting avenue of investigation. The chemical properties of ascorbic acid are such as to reduce the alkalinity of the sulfonamides. The vitamin also lends a hygroscopic factor which tends to prevent caking of sulfanilamide, thus prolonging uniform absorption. In order to have visual control of the advantages of the sulfonamide ascorbate, the drug was used in chronic, nonhealing wounds of long standing, in which bone would particularly be involved. Such easily visualized wounds involving bone are found in unhealed cavities following radical mastoidectomies and in ears with chronic suppurative otitis media and defects of the drum membrane. The routine procedure was to irrigate the ear cavity, dry the area and then fill the mastoid cavity, the middle ear and the external canal with the sulfanilamide ascorbate. The author presents a number of cases which indicate that sulfanilamide ascorbate and sulfathiazole ascorbate both stimulate healing with epithelization.

California and Western Medicine, San Francisco

61:49-128 (Aug.) 1944

New Problems in Field of Industrial Toxicologist. Alice Hamilton. —p. 55.
Hormones and Skin. I. R. Bancroft.—p. 60.
Scrub Typhus. A. C. Reed.—p. 62.
War Anesthesia in South Pacific. E. H. Kelley.—p. 63.
Outbreak of Shigella Newcastle Dysentery. V. G. Rubenstein and R. L. Phillips.—p. 64.
*Dermatitis of the Feet and Hands Due to Rubber. C. R. Anderson. —p. 65.
Diabetic Coma. H. Stephens and H. I. Burtness.—p. 66.
California Industrial Accident Fee Schedule. H. F. Peart.—p. 67.
National Medical Legislation. D. H. Murray.—p. 68.
Contagiousness of Scarlet Fever. H. O. Swartout and W. P. Frank. —p. 72.
Emergency Maternity and Infant Care (E. M. I. C.) Program. W. B. Thompson.—p. 72.
Kenny Treatment in Poliomyelitis: Evaluation. J. W. McFarland. —p. 76.

Dermatitis of Feet and Hands Due to Rubber.—Rubber dermatitis of the feet most often affects women, as rubber is used extensively in the manufacture of women's shoes. Rubber cement is used for basting the shoes during the sewing process and for fastening down the sock liner to the inner sole. An elastic rubber fabric is used frequently as an inner lining. The dermatitis may be manifested by erythema, edema, vesiculation, weeping and crusting. It may involve any part of the foot. However, it most frequently appears first on the toes. The sides of the heels are also early sites. Rubber dermatitis of the feet should be suspected when the patient has had a previous dermatitis from rubber girdles, dress shields and garters. There may be confusion with acute dermatophytosis of the feet. Physicians suffering from an eczematous dermatitis of the hands and feet are occasionally subjected to futile treatment for dermatophytosis when actually suffering from surgical glove dermatitis and rubber dermatitis of the feet. Sensitivity to rubber gloves should not be ruled out until patch tests have been performed on the back of the hands. The treatment requires elimination of exposure to rubber, which may prove difficult and, especially in women, may necessitate the purchase of custom built shoes in which all rubber has been eliminated.

Canadian Journal of Public Health, Toronto

35:297-336 (Aug.) 1944

Experiences in Diphtheria Control in Northern British Columbia. R. C. Knipe.—p. 297.
*Streptococcal Epidemic in Children's Surgical Ward. M. Elizabeth Doyle and Elizabeth Chant Robertson.—p. 302.
*Trial of Dysentery Toxoid (Shiga) in Human Volunteers. L. Farrell, D. T. Fraser and Helen Ferguson.—p. 311.
Health Officer and Cyanide Fumigation. D. V. Currey.—p. 317.
Population Estimates in Wartime. A. B. Valois.—p. 321.

Streptococcic Epidemic in Children's Surgical Ward.—An epidemic of streptococcic infections in a surgical ward of a children's hospital provided material for study by Doyle and Chant Robertson. The ward admitted surgical patients from 2 to 5 years of age. The ward was overcrowded at the time of the epidemic. Most of the beds were separated only by a small table 20 inches wide, and the children could exchange toys with ease. Close contact of patients due to overcrowding of the ward, the presence of infected attendants, inadequate washing facilities and the presence of hemolytic streptococci in the air were the important factors. The epidemic was checked by removing all those with positive throat cultures, closing the ward to admissions and visitors, using flannelette masks and separate gowns in attending each patient, spacing the beds 9 feet apart, providing adequate washing facilities for the personnel, using a reliable hand antiseptic and wet mopping the floor instead of sweeping. A negative Dick test did not indicate immunity to scarlet fever caused by this strain of hemolytic streptococci. The advantage of a more rapid method of typing hemolytic streptococci became evident during the course of this investigation.

Trial of Dysentery Toxoid (Shiga) in Human Volunteers.—In a previous report Farrell and his associates presented laboratory and clinical data which suggested that the experimental product dysentery toxoid (Shiga) was antigenic and safe for human use and would afford a reasonable hope of protection against dysentery caused by Bacterium shigae. The present report describes the reactions of 142 persons who received 1 to 4 doses of 0.25 or 0.5 cc. of the toxoid at various intervals, or a total of 377 injections, and sets forth the results of titration of antitoxin in 215 samples of blood taken from 100 persons at different stages in the process of immunization. Three groups of persons received 3 injections at intervals of ten, twenty-one and forty days respectively, and the ten day group received a recall dose three months after the third dose. The reactions to the injections, both local and systemic, were of the same order as those to the combined antigen T. A. B. T. Provided due caution is observed in the proper testing of the toxoid in laboratory animals, it would appear that a field trial of this material could be undertaken without undue concern. The antitoxic response was strikingly better after 3 doses than after 2. Long intervals between doses were advantageous, but the differences were not great.

Delaware State Medical Journal, Wilmington

16:105-118 (July) 1944

Surgery of Gallbladder and Common Bile Duct. G. S. Serino.—p. 105.

16:119-144 (Aug.) 1944

Morbidity and Population Trends. E. Cameron.—p. 119.
High School X-Ray Survey. L. D. Phillips, A. M. Dietrich and G. T. Evans.—p. 120.
Postwar Planning in Public Health Field. R. C. Beckett.—p. 122.
Survey of Birth Registration. C. A. Marshall.—p. 125.
War Wives and GI Babies. C. P. Knight.—p. 126.
*Mortality and Prevalence of Heart Disease in School Children of Delaware. J. W. Williams, M. Dressler and R. S. Snow.—p. 129.
Operational Shortcomings of Division of Communicable Disease Control. J. W. Williams and A. R. Cameron.—p. 131.
Important Factors in Control of Syphilis. A. R. Cameron and J. W. Williams.—p. 133.
Laboratory Comments Re Syphilis. R. D. Herdman.—p. 135.
What County Health Unit Means to Doctor and His Community. Katharine B. Franklin.—p. 137.
Newer Knowledge of Nutrition in Pregnancy. Eleanor M. Wilkinson. —p. 139.
Public Health Nursing in Prevention and Control of Tuberculosis. Alberta B. Wilson.—p. 141.
Role of Medical Social Worker in Delaware State Board of Health. Eunice Usher.—p. 142.

Heart Disease in School Children.—According to Williams and his collaborators, heart disease ranks high as a cause of death among children over the age of 5 years. In the national figures for the year 1939 heart disease was second to accidents as a cause of death in the age group 10 to 14 years. The figures for the state of Delaware indicate the same tendency. For the entire age span from 5 to 19 years heart disorders caused more deaths than any other condition except accidents. Examination of the hearts of 2,990 children of Kent and Sussex counties in Delaware disclosed 22 children with clinical evidence of organic heart disease, a prevalence rate of 0.7 per cent. Of this group of 22 there were 9 with murmurs characteristic of congenital heart disease and 13 with evidence of rheumatic heart disease. The latter condition was fairly evenly distributed between the children of the elementary and high schools but was somewhat more frequent in the Negro than in the white children. Arrythmias consisting of 6 cases of extrasystoles and 1 of bradycardia were discovered. A group of 59 additional children had slightly abnormal cardiac sounds which were designated as accidental murmurs. The survey suggested the need for a program for the supervision and care of these children with heart disease. Such a program would include the following activities: 1. Case finding, with reports from physicians of cases of heart disease or rheumatic fever. 2. A central file of the records of these children. Such a file has already been started for records of children found in school surveys. 3. A consultation service with a thorough examination of children suspected of having heart disease. 4. Adequate care of acutely ill children to include beds for those requiring prolonged convalescent care. 5. Broad educational programs for instruction of nurses, physicians and the public in the problems of heart disease, the dangers of rheumatic fever and the methods of care.

Journal of Immunology, Baltimore

49:71-128 (Aug.) 1944

New Salmonella Type. Salmonella Claibornei. K. S. Wilcox and Elizabeth K. Lennox.—p. 71.
Hemagglutination by Products of Influenzal Virus Using Infected Mouse Lung and Chick Embryo as Source of Virus. E. Twyble and H. C. Mason.—p. 73.
Simplified Procedure for Titrating Hemagglutinating Capacity of Influenza Virus and Corresponding Antibody. J. E. Salk.—p. 87.
Immunochemistry of Allergens: VI. Anaphylactogenic Properties of Protein Component of Kapok Seed and Relationship of Kapok Seed Antigens to Cottonseed Antigens. E. J. Coulson, J. R. Spies and H. Stevens.—p. 99.
Attempts to Obtain Specific Agglutination of Mixtures of Collodion Particles or Bacterial Cells with Virus and Antiviral Serum. H. E. Pearson.—p. 117.
*Inactivation of Influenza Virus by Mild Antiseptics. W. B. Dunham and W. J. MacNeal.—p. 123.

Inactivation of Influenza Virus by Mild Antiseptics.—Dunham and MacNeal reported studies on the action of bactericidal agents on the vaccinial virus. The tests were performed by injecting mixtures of the viral suspension and antiseptics into embryonated eggs. A similar technic, with modifications, was employed in the present study on the influenza virus. A number of antiseptics were tested for their inactivating effect on the virus of influenza during a brief period of exposure. This was accomplished by preparing mixtures of the antiseptics and virus, allowing them to remain in contact for three minutes, diluting the mixtures to the point where they would not be toxic for chick embryos and then injecting the material into embryonated eggs. Survival of the embryos indicated inactivation of the virus. The following preparations were found to inactivate the virus in three minutes or less: phenol, 3 per cent; tincture of iodine, U. S. P. XII, 0.1 per cent; Lugol's solution, U. S. P. XII, 1 per cent; mercury bichloride, 1:1,000; potassium permanganate, 1:1,000; copper sulfate, 1 per cent; propylene glycol, 90 per cent; liquor antisepticus, N. F. VII, 80 per cent.

Journal of Infectious Diseases, Chicago

75:1-102 (July-Aug.) 1944. **Partial Index**

Effect of Immunity on Asexual Reproduction of Plasmodium Brasilianum. W. H. Taliaferro and Lucy Graves Taliaferro.—p. 1.
Study of Defense Mechanism Involved in Hereditary Resistance to Pullorum Disease of Domestic Fowl. J. M. Severens, E. Roberts and L. E. Card.—p. 33.
Carbohydrate-Lipid Fraction of Gonococcus and Meningococcus. A. K. Boor and C. P. Miller.—p. 47.
Studies on Transmission of Hemolytic Streptococcus Infections. M. Hamburger Jr.—p. 58.
Cultivation of Human Tubercle Bacilli on Egg Mediums. Dorothy M. Powelson and Janet R. McCarter.—p. 95.

Journal of Nervous and Mental Diseases, New York

100:115-228 (Aug.) 1944

Bruns Syndrome. B. J. Alpers and H. E. Yaskin.—p. 115.
Cerebellar Type of Ataxia Associated with Cerebral Signs. A. J. Arieff and L. A. Kaplan.—p. 135.
Current Views on Neuropsychiatric Effects of Barbiturates and Bromides. F. J. Curran.—p. 142.
Psychiatric Aspects of Epilepsy. E. Davidoff, G. M. Doolittle and V. I. Bonafede.—p. 170.
*Subarachnoid Administration of Pyridoxine Hydrochloride in Diseases of Nervous System (Preliminary Report). S. Stone.—p. 185.

Pyridoxine Hydrochloride in Diseases of Nervous System.—Stone administered pyridoxine hydrochloride intraspinally to 26 patients with various disturbances of the nervous system. The average dose was 30 mg. for children and 50 mg. for adults, with one to four injections per patient. It was well tolerated by all of these patients, and no untoward reactions were observed following its use. In a case of Sydenham's chorea of long standing, complete disappearance of choreic movements followed three injections of 50 mg. of pyridoxine at weekly intervals. In 2 other cases great improvement was observed following administration of a single dose of 50 mg. In 2 cases of infectious meningomyeloradiculitis and 1 case of anterior poliomyelitis, relaxation of muscular rigidity, some improvement in muscle strength and increase in range of passive and active movements became apparent within twenty-four hours after intraspinal administration of 50 mg. of pyridoxine. It hastened recovery in a case of Korsakoff's disease which failed to respond to prolonged intramuscular and oral vitamin therapy. It also produced disappearance of pain and limitation of leg extension in a case of sciatic neuritis of unknown etiology after two intraspinal injections of 50 mg. at a weekly interval. Reduction of spasticity, improvement in gait and decrease of hyperreflexia were observed in a case of multiple sclerosis and a case of spastic paraplegia of unknown etiology following a single injection of 50 mg. In cases of dementia paralytica and the tabetic form of dementia paralytica the improvement was manifested in increased alertness, improvement in the sense of well-being, better coordination and improved ward behavior. Pyridoxine appeared to be of value when combined with intraspinal thiamine hydrochloride and artificial fever therapy. The favorable results observed in this small group of cases would seem to indicate that pyridoxine hydrochloride when administered intraspinally is an important adjunct in the treatment of postinfectious states and degenerative diseases of the nervous system, either when used alone or in combination with other vitamins or other methods of treatment.

Journal of Nutrition, Philadelphia

28:71-140 (Aug.) 1944

Effects of Glucose, Fructose and Galactose on Respiratory Exchange of Goat. E. G. Ritzman and T. M. Carpenter.—p. 71.
Role of Dietary Fat and Linoleic Acid in Lactation of Rat. J. K. Loosli, J. F. Lingenfelter, J. W. Thomas and L. A. Maynard.—p. 81.
Vitamin C Level of Blood Plasma in Guinea Pigs. L. Karel and C. W. Chapman.—p. 89.
Further Studies on Vitamin C Metabolism of Preschool Children. Frieda L. Meyer and Milicent L. Hathaway.—p. 93.
Nutritive Value of Canned Foods: I. Introduction and Sampling Procedure. L. E. Clifcorn.—p. 101.
Id.: II. Ascorbic Acid and Carotene or Vitamin A Content. Anne Pressley, Clara Ridder, M. C. Smith and Emily Caldwell.—p. 107.
Id.: III. Thiamine and Niacin. Margaret Ives, J. R. Wagner, C. A. Elvehjem and F. M. Strong.—p. 117.
Id.: Riboflavin and Pantothenic Acid. Mary Louise Thompson, Elizabeth Cunningham and Esmond E. Snell.—p. 123.
Id.: Distribution of Water Soluble Vitamins Between Solid and Liquid Portions of Canned Vegetables and Fruits. Miriam K. Brush, Winifred F. Hinman and Evelyn G. Halliday.—p. 131.

Journal of Pediatrics, St. Louis

25:105-190 (Aug.) 1944

Stomatitis and Diarrhea of Infants Caused by Hitherto Unrecognized Virus. G. J. Buddingh and Katharine Dodd.—p. 105.
*Treatment of Influenzal Meningitis with Sulfadiazine: Further Report. W. Sako, C. A. Stewart and J. Fleet.—p. 114.
Experiences with Convenient Method for Culturing Stools. J. Fleet and C. A. Stewart.—p. 127.
*Treatment of Hyperthyroidism in Children. C. B. McIntosh.—p. 133.
Eruption of Deciduous Teeth. H. C. Sandler.—p. 140.
Treatment of Vascular Nevi. C. R. Anderson.—p. 148.
Cor Biloculare: Report of Case. F. R. Shechter and D. R. Meranze.—p. 150.
Lymphoblastoma in Children Under 13 Years of Age. I. I. Kaplan.—p. 155.
Osteogenesis Imperfecta and Osteopsathyrosis: Contribution to Study of Their Identity and Their Pathogenesis. S. Rosenbaum.—p. 161.
Examination of Development of Certain Adaptive Behavior Patterns in Infants. Sarah S. Morgan and J. J. B. Morgan.—p. 168.

Sulfadiazine in Influenzal Meningitis.—Sako and his associates report that 16 of 23 children with influenzal meningitis given sulfadiazine have been discharged as cured and have remained well. One patient developed and still has a residual generalized spasticity. Six fatalities occurred, all in infants below 8 months of age. There was only 1 recovery in the group of infants under 8 months of age. No fatalities occurred above the age of 8 months. Since sulfadiazine alone does not seem sufficient for young infants, it is imperative that type specific rabbit antiserum be given together with large doses of sulfadiazine. In older infants and children the recovery rate is high with sulfadiazine alone. Few spinal punctures and drainages were performed. Leukopenia in 1 patient, hematuria in 1 and drug fever in 1 were the only toxic conditions encountered that can be attributed to the drug.

Treatment of Hyperthyroidism in Children.—Recent controversy regarding the treatment of toxic diffuse goiter in children induced McIntosh to review the records of the children with the disease who were treated at the University Hospital

of Iowa City between 1925 and 1943. All of the 23 children were girls ranging in age between 7 and 16 years. Nineteen of the patients were subjected to subtotal thyroidectomy and 4 were treated without surgery. In the group of children operated on were 9 complete arrests, 3 nearly complete arrests, 5 recurrences and 2 deaths. The patients not operated on were all successfully treated by conservative management. The medical management of the 4 patients was not the same in all cases. All of them received bed rest during the period of hospitalization. Each also received phenobarbital sedation, the dose being regulated symptomatically. A high caloric and high carbohydrate diet was insisted on in each case. Lugol's solution was given to 3 children. The other child received no iodine therapy. Roentgen therapy was used in 2 instances after medical treatment alone appeared to be inadequate. The average period of time for the treatment of the patients operated on was six weeks, while that of those not operated on was seven months. Children deserve an adequate trial of medical management before surgery is advised, and for a considerable number of them surgery is neither necessary nor desirable.

Journal Pharmacology & Exper. Therap., Baltimore

81:209-306 (July) 1944

Local Nervous Tissue Changes Following Spinal Anesthesia in Experimental Animals. Co Tui, A. L. Preiss, I. Barcham and M. I. Nevin. p. 209.
Distribution Method for Differentiation of Urinary Excretion Products of Sulfonamide Drugs and Role of These Products in Urolithiasis. J. V. Scudi and Viola C. Jelinek.—p. 218.
Toxicity and Trypanocidal Activity of Some Organic Antimonials. L. G. Goodwin.—p. 224.
Contribution to Pharmacology of Aliphatic Amines. R. P. Ahlquist. —p. 235.
Studies on Shock Induced by Hemorrhage: VIII. Inactivation of Apoenzyme of Amino Acid Oxidase and Lactic Dehydrogenase in Anoxia. Margaret E. Greig.—p. 240.
Bone Marrow Procedure for Assay of Liver Extracts for Anti-Pernicious Anemia Activity. C. M. Young and H. D. Bett.—p. 248.
Toxicologic and Pharmacologic Investigation of Sodium Sec-Butyl Ethyl Barbituric Acid (Butisol Sodium). C. M. Gruber, F. W. Ellis and G. Freedman.—p. 254.
Clinical Actions of Ethylnorsuprarenin. M. L. Tainter, W. M. Cameron, L. J. Whitsell and M. M. Hartman.—p. 269.
Toxicity and Trypanocidal Activity of p-Sulfonamidophenylarsonic Acid and Certain of Its Derivatives. E. L. Way and L. K. Chan.—p. 278.
Acute Toxicity for Mice of "Mapharsen" and Sodium Sulfathiazole Administered Separately and in Combination. Elizabeth M. Cranston, W. G. Clark and E. A. Strakosch.—p. 284.
Relation of Intensity of Morphine Abstinence Syndrome to Dosage. H. L. Andrews and C. K. Himmelsbach.—p. 288.
Inhibition of Nervous Transmission in Synapses and End Plates by Thiamine. K. Unna and E. P. Pick.—p. 294.
Sulfamerazine (2-Sulfanilamido-4-Methylpyrimidine): III. Comparative Activity of Sulfamerazine, Sulfadiazine and Sulfapyridine in Production of Hemolytic Anemia in Mouse. A. R. Latven and A. D. Welch. —p. 301.

Medical Annals of District of Columbia, Washington

13:285-318 (Aug.) 1944

*Relationship of German Measles During Pregnancy to Congenital Ocular Defects. B. Rones.—p. 285.
Modern Approach to Divorce Evil. J. R. Ernst.—p. 288.
Prevention of Pulmonary Embolism. L. B. Rose.—p. 291.
Prognosis of Spontaneous Subarachnoid Hemorrhage. H. J. Forrest. —p. 294.

German Measles During Pregnancy and Congenital Ocular Defects.—Rones presents histories of 4 infants whose ocular defects lend support to the claims of Australian observers that exanthematous disease in the mother during the early months of pregnancy can result in congenital ocular abnormalities in the child. Three of the mothers had had rubella and 1 had had morbilli. In the 2 cases in which the exanthem occurred during the second month of pregnancy the infants had cataracts, while in the 2 with the disturbance in the third month congenital glaucoma was present. Not all cases of congenital ocular abnormalities are due to an exanthematous disease in the mother during pregnancy. Many other factors can operate to produce such disturbances. More cases will have to be compiled before the occurrence of exanthems in the mother and ocular defects in the infants are accepted as causally related rather than coincidental. Rubella has been regarded as one of the most innocuous of the exanthematous diseases. We are now faced with the fact that the virus attacking a pregnant woman before the placental barrier has been developed can cause a disturbance to the developing fetus, and particularly to the optic buds.

Military Surgeon, Washington, D. C.

95:89-178 (Aug.) 1944. **Partial Index**

*Pemmican. V. Stefansson.—p. 89.
Physiologic Effects of High Temperatures. W. Machle.—p. 98.
Caring for the Eyes of Britain's Army. S. Duke-Elder.—p. 105.
Red Cross Services in Evacuation Hospital. L. H. Berman.—p. 107.
Veterinary Service at Army Post. D. M. Campbell.—p. 110.
Some Aspects of Venereal Disease Control in Army. C. S. Hendricks and J. D. Winebrenner.—p. 121.
Report of Case of Peripheral Neuritis with Hypertension Following Serum Therapy. H. F. Robertson and F. Varmus.—p. 129.
Meningococcic Meningitis. H. F. Wechsler and A. H. Rosenblum. —p. 132.
Complete Rupture of Tendo Achillis. M. G. Henry.—p. 135.
Secondary Repair of Rupture of Posterior Urethra with Case Report. S. Gersten.—p. 139.
Oral Aspect of Cleidocranial Dysostosis. W. S. Britt.—p. 143.
Management of Dermatophytosis. J. S. Snow.—p. 147.
Practical Walking Cast for Use Under Wartime Conditions. D. Goldberg.—p. 151.
Short PR Interval with Prolonged QRS Complex Associated with Paroxysmal Tachycardia. L. F. Bishop Jr. and R. W. Kimbro. —p. 153.

Pemmican.—Stefansson reviews the history of dried meats and of pemmican in particular. To make pemmican the Indian removed every trace of fat, split the lean into thin sheets and hung it up for wind drying. When thoroughly dry, the lean was converted into pounded meat. Bags were made of the hide of the animal in question (buffalo hide for buffalo meat, caribou for caribou meat and so on). These pillow size rawhide bags were filled loosely with pounded meat. Suet was then poured into the bag so as to percolate everywhere. The mouth was sewed up before the fat had time to harden completely and the bag tramped on or otherwise pressed so as to become flat, with a usual thickness of 6 or 7 inches. Pemmican seems to have kept as well in Oklahoma as in Manitoba. There are records of ten, twenty and more years in perfect condition. The author thinks that if our army used pemmican we could reduce by a third or half the weight and bulk of the meat element in a combination ration; with its nearly or quite exclusive use for certain purposes, we could reduce by a third or half the total weight and bulk of present special emergency or survival rations —such, for instance, as Army ration K, and we would have, from the start, a food which, in heat or cold, in moist or dry, is not experimental; an ancient Indian food that has been proved out by thousands of white users.

New England Journal of Medicine, Boston

231:71-110 (July 20) 1944

Toxic Factor in Experimental Traumatic Shock. J. C. Aug.—p. 71.
Renal Failure Simulating Adrenocortical Insufficiency. G. W. Thorn, G. F. Koepf and M. Clinton Jr.—p. 76.
Problem of Tuberculosis Control. J. A. Foley and J. B. Andosca.—p. 86.
Pigmentation of Skin. H. Jeghers.—p. 88.

231:111-168 (July 27) 1944

Infectious Mononucleosis Simulating Brucellosis. A. D. Rubenstein and Carolyn I. Shaw.—p. 111.
*Primary Suture of Simple Mastoid Wounds. L. F. Johnson and P. S. Spence Jr.—p. 116.
Cavernous Sinus Thrombophlebitis: Report of Case with Multiple Cerebral Infarcts and Necrosis of Pituitary Body. A. D. Weisman. —p. 118.
Pigmentation of Skin (continued). H. Jeghers.—p. 122.

Primary Suture of Simple Mastoid Wounds.—Johnson and Spence report their experience in 44 cases of acute mastoiditis in which treatment was primary closure of the wound after the cavity had been filled with sulfonamide powder. The technical demands for primary suture are exacting. The mastoid exenteration must be complete. Great care should be taken to remove all infected cells. The perilabyrinthian cells are removed until the horizontal semicircular canal is sharply defined. The zygomatic area is thoroughly cleaned out, and in a number of cases the incus is brought into view. The mastoid cavity is then irrigated with isotonic solution of sodium chloride followed by thorough drying of the cavity. If any bleeding persists, epinephrine packs may be used to establish complete hemostasis.

The cavity is then filled with sulfonamide powder. It appears to make little difference in the end result which sulfonamide drug is employed. In more than half of the cases thus treated the mastoiditis complicated scarlet fever. In these it was possible to reduce the period of hospitalization from an average of fifty-two days to twenty-seven days. Patients without scarlet fever went home with dry ears, and the postaural wound healed in an average of fifteen days. At first patients were kept in the hospital longer than absolutely necessary in order to observe the effects of primary suture. Those admitted later were allowed to go home in fewer days. No serious complications were seen in primary closure, even in cases in which the sinus or dura was exposed. The temperatures promptly returned to normal after every operation, and no intracranial complications were noted.

231:169-218 (Aug. 3) 1944

*Tularemia in New England: Review of 18 Cases, with Report of 2 Additional Cases. F. D. Moore, C. S. Sawyer and S. G. Blount Jr.—p. 169.
Vitamin B Deficiency in Private Practice. D. Merrill.—p. 174.
Purpose and Accomplishments of Lawrence Clinic. H. F. McCarthy and F. C. Atkinson.—p. 179.
Pigmentation of Skin (concluded). H. Jeghers.—p. 181.

231:219-248 (Aug. 10) 1944

Prelude to Ether Anesthesia. W. W. Ford.—p. 219.
Aids to Visual Education in Medicine. F. R. Harding.—p. 224.
Multiple Extragenital Giant Chancres: Report of Case. W. F. Lever. —p. 227.
Neurology. H. H. Merritt.—p. 230.

231:249-278 (Aug. 17) 1944

Delirium Tremens. C. B. Chapman.—p. 249.
War and Public Health. F. F. Russell.—p. 255.
Echinococcal Disease: Report of 2 Cases. T. W. Worthen and J. F. Jenovese.—p. 260.
Recent Advances in Surgery. A. Blalock.—p. 261.

Tularemia in New England.—Moore and his associates point out that New England appears to have been the last region in the United States to remain free of infection with Pasteurella tularensis, but now a total of 20 cases can be brought together. A chronological review of the New England cases is presented and 2 new cases are reported in detail. The first of these occurred in Massachusetts. A man aged 52 who had been bitten by an unidentified insect after three days began to notice occasional chilly sensations, fever and muscular weakness. Following a week of such symptoms he noticed soreness in the left axilla and a small papule at the site of the bite, which broke down and formed an ulcer. He poulticed the lesion and called in his physician, who gave him sulfadiazine for ten days. Since the fever and malaise persisted, as well as the ulcer and the sore node in the left axilla, he was referred to a hospital. Tularemia was suggested as a tentative diagnosis. A blood culture yielded no growth, and serum agglutination tests against Pasteurella tularensis were negative in all dilutions. The clinical course was one of continued swinging fever. A node developed in the right axilla and then generalized lymphadenopathy appeared. To obtain material to clarify the diagnosis, the ulcer was excised. The operative site healed cleanly, and the palpable nodes disappeared. Repeated agglutination tests for Past. tularensis were positive and the disease was now diagnosed as the ulceroglandular form of tularemia. The second patient, a man aged 36 from Rhode Island, four days prior to the onset of his illness had been hunting rabbits and had skinned and dressed them himself. He had a hangnail on the left thumb, and one day after the onset of the systemic illness the thumbnail became infected and the inflammation persisted despite treatment. For the eleven days until entry to the hospital this fever continued rising to 102 or 103 F. daily. Febrile illness with malaise, headache, cough and the infected thumb and axillary nodes continued. A diagnosis of ulceroglandular tularemia was made, and the possibility of pneumonic involvement was raised. Agglutination tests were positive against Past. tularensis in dilutions up to 1:80. Both of these patients recovered, but 3 of the 20 cases reported in New England have been fatal. The response of the Massachusetts patient to primary excision of the ulcer was striking, and if the results of this method are corroborated by other observers it may constitute a useful way of shortening the period of disability from the disease.

New Orleans Medical and Surgical Journal

97:1-42 (July) 1944

Evolution of Tuberculosis in Human Lung. C. A. Stewart.—p. 1.
Thirty-Five Millimeter Fluorography in Mass Chest X-Ray Surveys. R. A. Brown.—p. 4.
Permanent Presence of Specific Immunizing Antibodies in Blood of Yellow Fever Subjects: Experimentally Demonstrated by "Mouse Protection Test" Seventy-Seven Years After a Clinically Recognized Attack of Disease. R. Matas.—p. 9.
Milker's Nodule. M. T. Green.—p. 13.
Production and Treatment of Scars and Keloids. W. Marshall.—p. 15.
Food: Facts and Fads. P. R. Cannon.—p. 17.
Arthropod Borne Encephalitides of North America. J. L. Henderson. —p. 22.

97:43-92 (Aug.) 1944

Some Postwar Problems in Medical Education. L. H. Weed.—p. 43.
Diagnosis of Disease Without Instruments of Precision. R. H. Major. —p. 49.
Clinical Evaluation of Intradermal Test for Poliomyelitis. C. Ramirez. —p. 58.
Pneumoperitoneum in Treatment of Pulmonary Tuberculosis: Report of Patient Successfully Treated. B. M. Stuart, R. L. Pullen and J. L. Wilson.—p. 61.
Physiologic and Clinical Phenomena of Aging. E. P. Boas.—p. 64.
Blood Supply of Sternum: I. X-Ray Studies of Injected Sternums Showing Venous Return. P. Pizzolato.—p. 71.

New York State Journal of Medicine, New York

44:1615-1726 (Aug. 1) 1944

Clinical Experience with Penicillin. D. G. Anderson.—p. 1651.
Otolaryngologic Problems of Aviation. P. Northington.—p. 1655.
Dermatologic Diseases Frequently Encountered by Otolaryngologists. A. B. Cannon.—p. 1661.
Reinforcement of Sulfonamide Activity: Experimental and Clinical Observations. E. R. Neter.—p. 1669.
Results of Cancer Treatment. C. E. Farr.—p. 1673.
Ophthalmoscopic Signs of Terminal Hypertension. A. J. Bedell. —p. 1675.
Pentothal Sodium Anesthesia in Shock and Hemorrhage. C. K. Elder. —p. 1679.

44:1727-1838 (Aug. 15) 1944

Management of War Amputations in General Hospital. R. H. Alldredge. —p. 1763.
*Report of 85 Fenestration Operations for Otosclerosis. J. M. Smith. —p. 1771.
Fluorescence with Wood Filter as Aid in Dermatologic Diagnosis: Observation on Patients at Bellevue Hospital. M. J. Costello and L. V. Luttenberger.—p. 1778.
Evaluation of Various Methods of Treatment of Chronic Cervicitis. M. N. Hyams.—p. 1785.
Goals and Objectives in Psychotherapy. L. R. Wolberg.—p. 1792.
Common Cold. H. Adler.—p. 1797.
Correlation of Peritoneoscopic Findings with Clinical and Pathologic Factors, Especially of Liver. L. P. Wershub.—p. 1803.
Basic Concepts of Alcoholics Anonymous. W. G. Wilson.—p. 1805.

Fenestration Operations for Otosclerosis.—In a previous report Smith reported 32 cases of fenestration operation. About one third of these were successful. The results have greatly improved in the 53 additional operations reviewed in this article. The improvement in the results dates back to the new location of the fistula. In the first 18 operations of the total of 85 the fistula was made over the length of the external semicircular canal posterior to the ampullated end, with the head of the malleus removed and the incus in its normal position. In the rest of the series, 67 in number, the fistula was moved forward over the dome of the vestibule anterior to the ampullated end of the horizontal semicircular canal, with the head of the malleus and the incus removed. The results immediately were better. The fact requiring special emphasis is that in a vast majority of the cases of otosclerosis there is a gradual loss of hearing extending over a considerable time before there is a serious impairment of nerve function. It is during this stage that the operation offers the best chance for a successful and lasting result. If allowed to continue uninterrupted, the loss of nerve function will reach a point where the patient cannot be helped by the operation. The author performed the fenestration operation on 6 patients with severe loss in air and bone conduction. These patients submitted to the operation after being told the poor prospects. There were no successful results in these patients. The fact that there were no complications or deaths in the 85 reported cases prove that it may be performed without undue risk to the patient. It is dangerous in the hands of the untrained technician. The operation must first be taught on the cadaver, and the necessary time and effort

must be devoted to the correlation of the intricate steps comprising its technic before it is attempted on the living. The successful fenestration operation not only restores practical hearing but also checks the progress of otosclerosis.

Ohio State Medical Journal, Columbus

40:709-804 (Aug.) 1944

*Outbreak of Typhoid Fever Attributed to Baked Beans Contaminated by Chronic Typhoid Carrier. E. E. Kleinschmidt.—p. 725.
Benign Pulmonary Changes in Arc Welders: Arc Welders' Siderosis. J. A. Groh.—p. 732.
Ménière's Syndrome. J. A. Rudolph.—p. 736.
Radiation Therapy as Method of Treatment in Nonmalignant Conditions. I. M. Platt.—p. 738.
Operability versus Curability of Cancer of Breast. U. V. Portmann. —p. 742.
Chordotomy. E. W. Shannon.—p. 746.
Ruptured Saccular Aneurysm of Circle of Willis in Patient Cured of Gastric Carcinoma. T. C. Laipply.—p. 750.

Typhoid Outbreak Attributed to Contaminated Baked Beans.—Kleinschmidt describes an outbreak of typhoid resulting in 60 known cases in Toledo, Ohio, and 21 others in three counties in southern Michigan occurring in the months of June and July 1943. Epidemiologic investigation revealed the outbreak to be due to the eating of baked beans contaminated by a single chronic typhoid carrier living in Toledo. This outbreak established a new route of spread for typhoid and directed attention to the need for more careful health supervision of wholesale food establishments, especially those engaged in dispensing prepared foods. It emphasizes the necessity for continued effort to control typhoid carriers and illustrates the explosive potentialities of outbreaks of this disease despite a downward trend in its incidence and a condition of apparent safety, as might be inferred from current statistical observations.

Physiological Reviews, Baltimore

24:297-408 (July) 1944

Anticoagulants Effective in Vivo, with Special Reference to Heparin and Dicumarol. A. J. Quick.—p. 297.
Hyperpnea of Muscular Exercise. J. H. Comroe, Jr.—p. 319.
Lactation. W. E. Petersen.—p. 340.
Maintenance of Nitrogen Balance by Intravenous Administration of Plasma Proteins and Protein Hydrolysates. R. Elman.—p. 372.
Functional Organization of Cerebral Cortex. W. S. McCulloch.—p. 390.

Public Health Reports, Washington, D. C.

59:1041-1076 (Aug. 11) 1944

Simplified Procedure for Detecting Cross Reactions in Diagnostic Antipneumococcic Serum. Bernice E. Eddy.—p. 1041.
X-Ray Exposure in Manufacture and Operation of Certain Electronic Tubes. A. F. Bush, H. T. Castberg and D. G. Macpherson.—p. 1045.

59:1077-1102 (Aug. 18) 1944

Studies on Duration of Disabling Sickness: V. Frequency of Short Term Absences and Its Relation to Total Frequency. W. M. Gafafer and Rosedith Sitgreaves.—p. 1077.
Pathologic Changes in Animals Exposed to Commercial Chlorinated Diphenyl. J. W. Miller.—p. 1085.

59:1103-1130 (Aug. 25) 1944

*Methods of Sanitizing Eating and Drinking Utensils. J. Andrews. —p. 1103.

Methods of Sanitizing Eating and Drinking Utensils.—Andrews reports the results of a comprehensive survey of eating and drinking establishments made in an Eastern city. Bacterial counts were made of plates, tumblers, spoons, forks and beer glasses. The lowest count reported, 2,800, was on spoons at eight soda fountains. The highest count, 7,000,000, was on beer glasses at nineteen barrooms. The next to the highest count, 390,000, was on tumblers at the eight soda fountains. Each figure is the average "swab count" of ten utensils. Rabbit blood agar was used for plating. These counts, all of which are greatly in excess of the standard of 100 organisms per utensil surface, show the need for improvement in dishwashing practice. On the average, lower bacterial counts are obtained with machine washing than with hand methods. However, the data do not justify the conclusion that manual methods should universally be discarded in favor of dishwashing machines. Satisfactory results can be obtained by either method. During the rush hour dishes will frequently be put through the machine too rapidly to give proper washing and rinsing. Observations at one large cafeteria during the noon rush showed that for a group of ten consecutive racks of dishes washed one rack was in the machine for only twenty seconds, four for thirty seconds, three for forty-five seconds and two for sixty seconds. The shorter exposures are inadequate. One solution of this problem is to encourage the restaurant to have in use a large enough supply of utensils to tide over the rush period without having to make the dishwashing operation only a pretense. Frequently the person doing the dishwashing has not been instructed in the proper dishwashing technic and has not been impressed with the importance of his job. Since the outbreak of war, the problem of maintaining good sanitation in restaurants has been intensified by shortages of manpower and materials and increased customer loads. There are indications that the amount of disease spread in restaurants is increasing.

Radiology, Syracuse, N. Y.

43:107-212 (Aug.) 1944

Correlation of X-Ray Diagnosis with Operative Findings in Small Intestinal Obstruction. C. J. Hunt.—p. 107.
Roentgenologic Features of Mediastinal Tumors. L. L. Robbins.—p. 115.
*Statistical Analysis of 100,000 Examinations of Chest by Photoroentgen Method. P. Zanca and F. K. Herpel.—p. 122.
Further Experiences with Venography. E. C. Baker and F. A. Miller. —p. 129.
Anteroposterior Lordotic Projection in Roentgenographic Examination of Lungs. G. Lavner and B. Copleman.—p. 135.
Neurosurgery and Radiation for Relief of Pain in Advanced Cancer. G. Cooper Jr. and V. W. Archer.—p. 142.
Ureter and Its Involvement in Pelvic Irradiation. E. E. Mansur.—p. 147.
Development of Centralized Radon Services in Australia. C. E. Eddy. —p. 155.
Evolution of Improved Transvaginal Speculum. A. W. Erskine.—p. 170.
Barium-Gelatin Mixture for X-Ray Examination of Digestive Tract. M. S. Abel.—p. 175.

Analysis of 100,000 Examinations of Chest.—Zanca and Herpel present the results of routine examinations of the chest by the photoroentgen method in 100,000 consecutive selectees. Stereoscopic roentgenograms on 4 by 10 inch films have been found highly satisfactory, economical, easy to handle and process, susceptible of being rapidly interpreted with minimum eye strain and fatigue, and superior in definition to 14 by 17 inch films. The rejection rate for pulmonary tuberculosis in this series was 4.91 per thousand examined. This rejection rate applies to all types of pulmonary tuberculosis, from far advanced active cases with cavitation to the chronic minimal fibrous or apparently arrested cases in which stability of the lesions was not yet demonstrated. The low rejection rate for tuberculosis at this station reflects creditably on the splendid antituberculosis program in North Carolina over the last quarter of a century, also on the screening out of known tuberculous selectees at the local boards of origin.

Rocky Mountain Medical Journal, Denver

41:449-528 (July) 1944

Rocky Mountain Spotted Fever: Diagnosis of Disease. G. E. Baker. —p. 466.
Screw-Worm Fly in Utah. H. L. Marshall and D. T. Jones.—p. 478.
Carcinoid Tumors of Appendix. W. W. King.—p. 480.

41:529-608 (Aug.) 1944

Perforating Wounds of Abdomen. F. H. Good and J. G. Hedrick. —p. 546.
*Poliomyelitis, 1943, Children's Hospital, Denver, Colo. Lula O. Lubchenco, R. Scandalis, H. D. Palmer and G. Valdemar.—p. 549.
Visceroptotic Syndrome. R. B. Weiler.—p. 555.

Poliomyelitis.—Lubchenco and her associates review observations in 120 cases of poliomyelitis treated during the last six months of 1943 at the Children's Hospital of Denver. All patients with acute and convalescent poliomyelitis were treated by the Kenny method. The technic as described by Kenny could not be followed in regard to frequency of treatments. Ten to twelve packs plus physical therapy every day was impossible except for the most severe cases because of the shortage of help. Hot fomentations were applied four to five times a day to most of the patients. In the very seriously ill with respiratory difficulties, packs were given as often as three to four times every hour. When persistent and severe spasm was

present, ten to twelve packs a day were applied. During the acute stage some patients would wake up during the night and ask for packs, which gave them relief. Physical therapy was started as soon as it could be given without causing pain in the spastic muscles. This consisted of passive exercises to the "alienated" and paralyzed muscles and muscle reeducation of those muscles in which some power was present. Tightness which frequently followed spasm was treated successfully by stretching exercises. Physical therapy was administered three or four times a week. Accurate localization and early evaluation of muscle spasm and weakness is necessary if one is to use the Kenny method effectively. Thirty-two per cent of the patients were discharged as recovered. Of these, 12 per cent had no muscle weakness on admission. An additional 58 per cent showed improvement of varying degree. Ten per cent showed no change. Thirteen patients have had braces applied and 4 more are soon to receive them. Spasm in one or more muscles was present in all the cases. The average duration of spasm ranged from 9.2 weeks (neck) to 16.3 weeks (hip adductors). Patients received hot fomentations for an average of fourteen weeks. In 14 of 88 cases deformities developed despite hot pack therapy. The mortality rate was 5.8 per cent. All of the seven deaths occurred in cases of poliomyeloencephalitis. The incidence of bulbar poliomyelitis was highest in those patients who had had operations in the mouth or pharynx. Three severe cases occurred within four weeks after tonsillectomy. One fatal case occurred two weeks after tooth extraction.

South Carolina Medical Assn. Journal, Florence

40:137-158 (July) 1944

Likelihood of Establishment of Alien Diseases in United States. H. S. Mustard.—p. 137.
Trends of Immunization in Present Day Pediatrics. M. W. Beach and B. O. Ravenel.—p. 140.

40:159-178 (Aug.) 1944

Prevention of Venous Thrombosis and Pulmonary Embolism. E. A. Hines Jr.—p. 159.
Chemotherapy in Bacterial Infections. W. H. Kelley.—p. 164.
Use of Sulfonamides in Surgery. J. McLeod.—p. 167.

Surgery, St. Louis

16:169-318 (Aug.) 1944

*Endocrine Treatment of Cancers of Prostate Gland. A. I. Dean, Helen Q. Woodard and G. H. Twombly.—p. 169.
Relationship of Hormones to Testicular Tumors. G. H. Twombly.—p. 181.
Adrenal Cortical Tumors—Physiologic Considerations. A. T. Kenyon. —p. 194.
Hormonal Tumors of Adrenal. G. F. Cahill.—p. 233.
Endocrine Activity of Thyroid Tumors and Influence of Thyroid Hormone on Tumors in General. J. Lerman.—p. 266.
Endocrine Aspect of Enlargements of Parathyroid Glands. O. Cope. —p. 273.
Hyperinsulinism in Relation to Pancreatic Tumors. A. O. Whipple. —p. 289.
Endocrinologic Aspects of Tumors of Pineal Gland. L. M. Davidoff. —p. 306.

Endocrine Treatment of Cancers of Prostate.—Dean and his associates review observations on 100 patients with cancer of the prostate. These patients were treated either by castration or by the administration of diethylstilbestrol given in doses of 1 to 5 mg. daily by mouth. Both forms of treatment have given striking clinical improvement, at least temporarily. Pain is abolished, appetite is increased and a gain in weight results. After seven to eight months the patients are apt to have a return of pain and obvious progression of disease to death. Institution of other treatment, diethylstilbestrol for the castrated patients or castration of the patients treated originally with diethylstilbestrol, fails to affect the unfavorable course. Some patients continue to remain clinically free from symptoms of prostatic cancer for two years or longer. The number of such prolonged arrests of cancer seems more frequent in the group treated with diethylstilbestrol than by castration, so that this has become the routine initial form of treatment in the last eighteen months. Diethylstilbestrol seems to cause regression in the size of the prostate and reduction in the amount of residual urine more frequently than castration. Changes in bony metastases are toward an increase in calcification. Elevation of serum acid phosphatase above 1 Bodansky unit is pathognomonic of prostatic cancer, although a low acid phosphatase does not rule out its presence. Serum acid phosphatase falls promptly in those patients who respond favorably to castration and rises again with a return of cancerous activity. The same changes occur more slowly in patients treated with diethylstilbestrol. Castration decreases estrogenic excretion in the urine and usually causes a rise in androgens as measured colorimetrically as 17-ketosteroids by the Callow-Zimmerman test. It causes a rise in excretion of pituitary gonadotropic hormones in the urine. The administration of diethylstilbestrol decreases the output of the 17-ketosteroids and the gonadotropic hormone from the pituitary. After its administration the excretion of diethylstilbestrol in the urine gives a great rise in the estrogen assays. These findings suggest that the mechanism whereby castration and diethylstilbestrol cause regression of prostatic cancers is fundamentally different.

War Medicine, Chicago

6:1-66 (July) 1944

Malnutrition During Convalescence. Prepared Under Direction of Committee on Convalescence and Rehabilitation of National Research Council.—p. 1.
Summary of Activities of Procurement and Assignment Service. F. H. Lahey and J. L. Kaukonen.—p. 10.
Visual Aids in Preventive Psychiatry. R. R. Cohen.—p. 18.
Dyspepsia Regimen: Method of Rehabilitation. A. A. Goldbloom and H. Schildkrout.—p. 24.
Dimethyl Phthalate as Repellent in Control of Phlebotomus (Pappataci or Sandfly) Fever. C. B. Philip, J. R. Paul and A. B. Sabin.—p. 27.
Subdural Hygroma: Report of 3 Cases. W. G. Haynes.—p. 34.
Psychiatric Voice Recordings in Military Service: Recorded Program. A. A. Rosner.—p. 38.

Wisconsin Medical Journal, Madison

43:765-900 (Aug.) 1944

Congenital Heart Lesion: Pulmonary Stenosis and Interventricular Septal Defect: Report of Case. M. Hardgrove and A. J. Gramling. —p. 793.
Recent Advances in Treatment of Meningitis. V. J. Cordes.—p. 795.
Sequelae of Fractures of Neck of Femur and Their Treatment. C. C. Schneider.—p. 799.
Hereditary Hemorrhagic Telangiectasia: Report of Case with Review of Literature. J. J. Barrock.—p. 805.

43:901-1000 (Sept.) 1944

Virus Diseases of Man. E. R. Krumbiegel.—p. 927.
Caudal Anesthesia. H. A. Cunningham.—p. 931.
Diffuse Hyperplastic Gingivitis. R. P. Gingrass.—p. 934.
*Refrigeration Amputation. J. L. Neller and E. R. Schmidt.—p. 936.
Intra-Abdominal Diverticulitis: Report of 11 Cases. J. J. Gramling Jr. —p. 942.
Tuberculosis Picture in Wisconsin. A. Filek.—p. 947.

Refrigeration Amputation.—Neller and Schmidt say that refrigeration was first applied at the Wisconsin General Hospital to a patient for whom, because of his extremely poor condition, no other therapy seemed to present a reasonable chance of success. This man, aged 65, entered moribund, with diabetic gangrene of the foot, gross infection, generalized sepsis and uncontrolled diabetic ketosis. The case was judged hopeless. Refrigeration amputation was performed and the result was so favorable that subsequently the authors used the method for 20 additional patients. All of them were poor risks, all had established gangrene, many had gross infection and general sepsis, were diabetic, and the average age was 68 years. The authors stress the importance of the proper selection of patients. Routine use of refrigeration is contraindicated. Patients requiring amputations who are not aged, who show no significant infection or general sepsis and whose general reserve is good are better managed under general anesthesia. Amputation for Buerger's disease should not be done under refrigeration because of (1) the vasospastic tendencies, (2) the lack of general toxemia and (3) the younger age level. Refrigeration amputation should be reserved for those patients who, because of senility, uncontrolled diabetes, infection, general sepsis or other complications would be poor risks for general anesthesia. Several different technics are used, depending on the clinical picture. The authors differentiate between surgical refrigeration and preliminary control refrigeration and further divide surgical refrigeration into primary and secondary types. These may be used singly or in combination. Proper use of these different technics will give best results.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Tuberculosis, London

38:37-102 (April-July) 1944

Pulmonary Hydatid Disease. N. R. Barrett and D. Thomas.—p. 39.

British Medical Journal, London

2:137-168 (July 29) 1944

Localization in Cerebrum and Cerebellum: Bertram Louis Abrahams Lecture. E. D. Adrian.—p. 137.
Some Problems in Riboflavin and Allied Deficiencies. H. S. Stannus. —p. 140.
Postoperational Strain in Navy. D. Curran and G. Garmany.—p. 144.
*Schick Reactions in Recently Confined Women and Their Infants. G. P. Wright and W. M. Clark.—p. 146.
Radiotherapy of Ectopic Calcification. E. Millington.—p. 148.

Schick Reactions in Recently Confined Women and Their Infants.—Wright and Clark made Schick tests during the first five days after delivery on 250 women. Schick tests were also carried out at some time during the first five days of life on the infants of 145 of this group of women. The authors found that considerably less than half of the infants born to women living in a typical outer London suburb have an adequate congenitally acquired immunity to diphtheria. So infrequently do the mothers come into contact with toxigenic Corynebacterium diphtheriae that their circulating antitoxin concentrations fall to levels considerably below the critical titer for the Schick test. While a large proportion of the positive reactors among these recently confined women are themselves immune in consequence of the promptitude with which their antitoxin forming tissues respond to the secondary stimulus of the specific toxin, their low antitoxin titer during pregnancy confers little or no immunity on their infants. In the event of an epidemic rise in diphtheria two possible measures might be instituted. First, infants might be immunized considerably younger than is now the custom: this procedure has the disadvantage that very young infants seem to respond less well to prophylactic immunization than older infants or young children. Secondly, it might be desirable to immunize all Schick positive pregnant women during the latter part of the gestation period. Such a procedure would at the same time immunize any woman who was susceptible and raise the maternal antitoxin titer to a high level about the time of the birth of the infant.

Journal of Pathology and Bacteriology, Edinburgh

56:145-288 (April) 1944

Pinealoma: Its Relationship to Teratoma. Dorothy S. Russell.—p. 145.
Sources of Blood Platelets and Their Adhesiveness in Experimental Thrombocytosis. Helen Payling Wright.—p. 151.
Spontaneous Folliculosis of Conjunctiva in Grivet and Vervet Monkeys (Lasiopyga Griseoviridis Syn. Cercopithecus Aethiops and L. Pygerythra Syn. C. Pygerythra) and the Susceptibility of Grivet to Trachoma Virus. J. O. W. Bland.—p. 161.
Filtration of Mycobacterium Tuberculosis and Mycobacterium Stercusis Through Gradocol Membranes. M. A. Soltys and A. W. Taylor. —p. 173.
Developing Factor in Experimental Blastogenesis. J. C. Mottram. —p. 181.
*Anemia Associated with Infection. M. F. Saifi and Janet M. Vaughan. —p. 189.
Architectural Structure of Upper End of Femur in Various Pathologic Conditions. W. Townsley.—p. 199.
Chronic Human Carrier of B. Aertrycke (Bact. Typhi-Murium) Treated by Cholecystectomy. H. Burt.—p. 209.
Toxic Effects of Propamidine, with Special Reference to Treatment of Burns. J. W. Allen, F. Burgess and G. R. Cameron.—p. 217.
Diabetogenic and Pancreotropic Actions of Ox Anterior Pituitary Extract in Rabbits. R. F. Ogilvie.—p. 225.
Incidence and Causes of Discrepancies in Results of Serologic Tests for Syphilis. F. M. Berger and P. L. Sutherland.—p. 237.

Anemia Associated with Infection.—Saifi and Vaughan investigated hemopoiesis in acute and chronic infections. The peripheral blood picture was studied over varying periods in three different types of cases: (1) mild infections such as furunculosis, acne and sties, (2) acute infections of not more than three months' duration and (3) subacute and chronic infections of more than three months' duration. Patients receiving sulfonamide drugs in a bigger total dose than 1 Gm. have been excluded, since these drugs have an effect on hemopoiesis in certain individuals. In the acute cases blood examinations were made every four or five days. In some instances reticulocyte counts were made daily. In the chronic cases the blood was examined at first every week and then every fortnight. A complete histologic study was made of the hemopoietic tissues in patients who died during the investigation. It was found that anemia was normocytic or microcytic in type, the color index never being above unity. A raised reticulocyte count occurred commonly in the chronic cases with severe anemia. In acute cases the reticulocyte count often rose when fever abated. Increased activity of the marrow was found in 12 of 15 cases examined, leukopoiesis predominating. There was no aplasia of erythropoietic tissue, primary erythroblasts and normoblasts being present with few mature red cells. The degree and character of the response appeared to be unrelated to the type of infection, the severity of the anemia or the age of the patient. It is suggested on analysis of the available evidence that anemia associated with infections is due to interference with the synthesis of hemoglobin.

Lancet, London

2:131-164 (July 29) 1944

Rehabilitation of Injured in This War and Last. H. A. T. Fairbank. —p. 131.
Naval Experience in Relation to National Health Service. S. Dudley. —p. 134.
Burns in Warfare. N. J. Logie.—p. 138.
Treatment of Varicose Veins by Diathermy. R. A. Smith.—p. 141.
*Synergic Action of Penicillin and Sulfonamides. J. W. Bigger.—p. 142.
Traumatic Retroperitoneal Rupture of Duodenum. P. A. Trafford. —p. 145.
Relapse of Quartan Fever After Twelve and Twenty-One Years. P. G. Shute.—p. 146.

Synergic Action of Penicillin and Sulfonamides.—The success which has attended the treatment of streptococcic, pneumococcic and gonococcic infections in man with the sulfonamides has not been repeated when the infecting organism is the staphylococcus. Penicillin is much more potent against staphylococci than is the best of the sulfonamides, but, despite the susceptibility of these organisms to penicillin in vitro, treatment of human infections, even when continued for a relatively long time, often fails to eliminate the bacteria completely from the body. It seems to be almost a universal practice, when penicillin treatment is initiated, to abandon the administration of sulfonamides if they have previously been employed. Bigger records experiments in which the method used has been titration of penicillin, with or without sulfonamide, in broth or serum-saline in 5 cc. amounts, the test organism being usually Staphylococcus pyogenes. The tubes were observed after twenty-four hours or in some cases longer periods of incubation for evidence of growth of the bacteria inoculated. The presence of sulfathiazole in broth greatly increased the dilution at which the inhibitory action of penicillin on staphylococci could be demonstrated. Sulfathiazole was more effective in this respect than either sulfanilamide or sulfapyridine. The same synergic action of sulfathiazole and penicillin can be demonstrated in serum. The action of penicillin against Streptococcus pyogenes is similarly reinforced by the presence of sulfathiazole. It is suggested that this synergic action of sulfonamides and penicillin should be employed in the treatment of suitable infections in man.

2:165-196 (Aug. 5) 1944

*Primary Tuberculous Infection in Nurses: Manifestations and Prognosis. M. Daniels.—p. 165.
*Resuscitation of Battle Casualties. D. S. Dick.—p. 170.
Intraoral Splint for Facial Palsy. A. G. Allen and D. W. C. Northfield. —p. 172.
*Note on Commonly Unrecognized Type of Injury to Cervical Spine and Spinal Cord in Association with Head Injuries. F. M. R. Walshe. —p. 173.
Antibacterial Values of Ethylene Glycol Monophenyl Ether (Phenoxetol). H. Berry.—p. 175.
Phenoxetol in Treatment of Pyocyanea Infections. J. Gough, H. Berry and B. M. Still.—p. 176.
Spontaneous Rupture of Esophagus. J. L. Collis, D. R. Humphreys and W. H. Bond.—p. 179.
Note on Thomas Splint. C. A. Pannett.—p. 180.

Primary Tuberculous Infection in Nurses.—Daniels reviews data obtained through the Prophit survey, which was inaugurated in 1934 by the Royal College of Physicians of London under the terms of the Prophit bequest. Nurses form only one of the five groups studied in the survey, the others

being medical students, contacts, volunteer controls and boys in the Royal Navy training establishments. Since the outbreak of war it has been impossible to continue the work in the last two groups. Each person entering the survey is required to fill in a record card, giving information on age, environment, race, previous illnesses, history of contact and previous occupation. This information is supplemented by the results of an initial Mantoux test and an initial x-ray film of the chest. Each person is reexamined annually by Mantoux test and x-rays, and note is taken of any clinical illness during the period since the preceding test. It becomes possible then to analyze the progress of groups with different backgrounds and different states of tuberculin sensitivity under differing conditions of exposure. This report analyzes data collected on nurses. The total number of nursing entrants to the survey up to March 1943 was 3,764. Nurses were Mantoux tested and x-rayed shortly after entry to the preliminary training school. Of the 3,764 entrants, 50.3 per cent were positive to old tuberculin 1 : 10,000 or 1 : 100,000, 30.5 per cent were positive only to 1 : 100 or 1 : 1,000 and 19.2 per cent were negative. The rate of Mantoux conversion in the first year was 58.4 per cent and 78.3 per cent in two hospital groups. The group with a higher conversion rate had a high proportion of strongly positive reactions revealing conversion. Most had no notable symptoms between the last negative test and the first positive. A study has been made of the tuberculous morbidity in nurses who entered the survey before 1942 and whose chest x-ray film on entry was clear: 33 cases occurred in 452 nurses initially Mantoux negative, 43 cases in 2,120 nurses initially Mantoux positive. The 33 cases arising in nurses Mantoux negative on entry are briefly described. Analysis reveals the diversity of aspects of tuberculosis following primary infection in adults. In many cases it is difficult to determine whether the primary focus or a secondary infection is responsible for the lesion observed. The annual case rate per thousand was 7.4 in nurses Mantoux positive on entry and 18.8 in those Mantoux negative. The rate was particularly high in the first year after Mantoux conversion. The evidence of this survey, and the combined evidence of twenty other surveys, show that the risk of tuberculosis developing after primary infection in young adults is a serious one. It is suggested that a controlled method of antituberculosis vaccination is needed. In the absence of vaccination, recommendations are made with the object of reducing the primary infection rate, detecting primary infection when it occurs and reducing the tuberculosis morbidity.

Resuscitation of Battle Casualties.—Dick's transfusion unit dealt in eighteen months with over 800 shocked patients. Transfusion of blood and plasma was undoubtedly the major factor in the resuscitation of these cases. The total amount of fluid used was 1,776 pints (average per patient 3.54 pints), which included 1,327 pints of blood, 315 pints of plasma and 134 pints of saline solution. Usually the transfusion of 2 pints at a fast rate was sufficient to restore the blood pressure. If after this the response was only sluggish, it was found better to take the lesser risk of earlier operation. The average time spent in the resuscitation ward was about two to four hours. In practically all cases the transfusion was continued in the operating theater and often in the postoperative ward as well. Severe blood loss at operation was met by rapid transfusion, and on occasion a second separate transfusion apparatus was set up on another limb. With such a procedure it was not uncommon to give before, during and after operation a total of 10 pints of blood without any question of overloading the circulation. This method of continued transfusion is perhaps not widely enough appreciated, and there is a false belief that resuscitation is usually only a preoperative measure. There has been a good deal of controversy over the relative merits of blood and plasma in the field. The author mentions the deceptive appearance of recovery gained by plasma transfusion after severe blood loss. This fact, together with the undoubted efficacy of stored blood, was borne out in two invasions. In the first, no stored blood was available. The fresh blood was reserved for cases of extreme blood loss. For the moderately severe cases reliance was placed wholly on plasma, and it was found that the blood pressure was restored without difficulty, but again the pulse rate remained relatively high; also it was apparent that postoperatively the cases did badly. In the second landing stored blood was available in quantity, but otherwise the conditions were similar. The results of transfusion in resuscitation were strikingly better and the condition of the patients after operation was much more encouraging. Reactions were fewer with stored blood than with plasma. With the blood, 5 per cent of the patients developed reactions in the form of slight or moderately severe rigors. With wet plasma the reaction rate was 7 to 8 per cent, but with the dry plasma this rate was around 20 per cent. Stored blood kept in good condition for at least twenty-one days in the refrigerator lorry, even during movement over rough roads.

Commonly Unrecognized Injury of Cervical Spine.—Walshe in 1936 with Ross reported cases of relatively mild head injury with asspciated damage to the cervical spine and spinal cord, in which the latter components had escaped notice during the period of treatment and had later been diagnosed under various titles as nontraumatic. Since then the author has observed further cases of this combined head and neck injury. The head injury is of the closed variety and is commonly mild. The injury involves a blow on the vertex or side of the head with an associated anterior or lateral flexion of the neck. The patient dives into shallow water, is thrown from horse or cycle, is flung out of a car or has fallen forward, striking the top of his head. In 1 case a sack of grain fell through an open hatch on the head of a man standing below. The mechanism of this cervical vertebral injury and its site of election between the fifth and sixth cervical vertebrae were described by Jefferson in 1928. The partial extrusion of the intervertebral disk has not been mentioned as a component of this injury, but in 1 recently observed case the narrowing of the relevant intervertebral space suggested that this had occurred. When he first comes under observation, still concussed or just recovering from concussion, the patient who has sustained this vertebral cord lesion is thought of as having head injury. The cord damage is not profound. "No one would listen to me when I complained about my arms" is the not rare later complaint of these patients. It is only when the patient is mobilized that the range of his disability becomes fully apparent to him and he may then find himself stiff and clumsy on his legs. Commonly he returns home and may even attempt to resume work. This he finds difficult. In a few weeks he notices that some muscles in the arms or hands are wasting, and he returns to his medical adviser. The condition is then labeled amyotrophic lateral sclerosis or disseminated sclerosis or, if a positive Wassermann reaction exists, the case is diagnosed as spinal syphilis. The clinical picture bears a superficial resemblance to motor neuron disease (amyotrophic lateral sclerosis, progressive muscular atrophy), yet the state of the tendon jerks in the arms, the persistence of paresthesias and the history suffice to make differentiation simple. The common failure to recognize this damage, with the subsequent tendency to erroneous diagnosis, may react unjustly on the sufferer's right to compensation. Some of these patients recover. Others remain with a fixed degree of disability, while yet others continue to deteriorate for some time as joint and muscle changes ensue.

Medical Journal of Australia, Sydney

2:1-24 (July 1) 1944

Influenza and Other Respiratory Infections. F. M. Burnet.—p. 1.
Culture of Tubercle Bacilli from Sputum: Review of Personal Experience of 310 Specimens. D. B. Rosenthal.—p. 6.
Medical Aspect of Naval Recruiting. W. E. Roberts.—p. 8.
Clinical Impressions of Skin Disease in Tropical Operational Area. W. K. Myers.—p. 10.

2:25-48 (July 8) 1944

Dr. E. S. P. Bedford and His Hospital and Medical School of Saint Mary's, Van Diemen's Land. W. E. L. H. Crowther.—p. 25.
Treatment of Ingrowing Toenails. T. E. Wilson.—p. 33.
*Gas Gangrene at Australian General Hospital in Owen Stanley and Buna-Gona Campaign. K. C. Ross and W. P. Ryan.—p. 35.

Gas Gangrene in the Owen Stanley and Buna-Gona Campaign.—According to Ross and Ryan the Owen Stanley and Buna-Gona campaign was noteworthy for the relatively high incidence of anaerobic infection of wounds. During the four month period from Nov. 1, 1942 to Feb. 28, 1943 1,815 Australian battle casualties were treated and 82 cases of clinical gas gangrene occurred (4.5 per cent). Of these 82 patients,

12 died. Amputation was performed as often for the nature of the wound as for the extent of the infection. Exhaustion and emaciation contributed to the mortality. The clinical types ranged from the classic fulminating infection to cases associated with merely a local abscess around a retained missile. The latter cases with frank pus formation were diagnosed only by the presence of gas in the pus and by the growth of Clostridium welchi in culture. In 3 patients there was little evidence of infection in the wound itself, but an acute, overwhelming cellulitic edema spreading from the wound commenced four to five days after the receipt of the wound. In 2 of these cases the wounds were trivial. Death occurred in each case within forty-eight hours of the commencement of the edema. Clostridia were isolated from all. All patients with gas gangrene were given a full course of sulfanilamide. Polyvalent antitoxin was given to 51 patients in doses of 20,000 to 200,000 units, the usual dose being 50,000 units. It is difficult to assess the value of antitoxin, but the impression was gained that it had some beneficial effect. Forty-nine patients received transfusions of blood and plasma. The initial amount was usually 1 liter of blood and 1 liter of plasma. A full course of antimalarial therapy has to be given to patients receiving blood collected in a malarious area. One of the authors had success with radical excision in the Libyan Desert. Therefore it was decided to employ this wherever possible and to be conservative with amputations. At first, whether anaerobic infection was present or not, operations took the form of débridement and partial excision rather than radical excision; but the authors soon learned to rely more and more on radical excision, no matter how old was the wound. Excision caused little or no local or general reaction, and several partly excised wounds needed reexcision a few days later. The authors became convinced that the time factor did not matter, and with adequate resuscitation they excised the wounds as completely as the anatomic situation would allow.

Journal de Radiologie et d'Electrologie, Paris

25:189-216 (1942-1943)

Failures in Radiation Therapy of Fibroma. J. Ducuing.—p. 189.
*Late Results of Roentgenotherapy of Glossoepiglottic Epitheliomas. F. Baclesse.—p. 190.
Treatment of Tuberous Angiomas of Young Children. S. Laborde.—p. 193.
Radium Therapy of Angiomas. L. Mallet and C. Proux.—p. 196.
Urethrographic Exploration of Cancers of Prostate. Mathey-Cornat and H. Duvergey.—p. 199.
Submicroscopic Study of Human Bones by Diffraction of X-Rays. P. Lamarque and J. Mering.—p. 201.

Late Results of Roentgenotherapy of Glossoepiglottic Epitheliomas.—Baclesse differentiates epitheliomas of the oropharynx into two groups: (1) those of the lingual base and (2) those of the valleculae and of the epiglottis which develop in the space between the steepest part of the pharyngeal slope, the glossoepiglottic folds and the free edge of the epiglottis. This differentiation is of importance in statistical evaluation because in the first group the results have been much less favorable than in the second. The author reviews the results obtained in 256 patients with epitheliomas of the oropharynx which were treated at the Curie Foundation between 1920 and 1938 inclusive. The minimum period of observation was four years. The author takes into account the local extension, the lymph node invasion and the anatomic and clinical aspects. Among the 256 patients there were 89 in whom the cancer was still localized. Of these, 18 (20 per cent) were cured, whereas of the 167 patients with cancers which had already invaded adjoining regions only 5 (3 per cent) were cured. Classification of cancers according to presence or absence of lymph node invasion revealed that the percentages of cure were 16 in those without and 6 in those with invasion. From the anatomoclinical and radiographic points of view the author differentiates four types of glossoepiglottic epitheliomas: (1) the proliferating types, which extend on the surface, do not invade and extend toward the lumen of the oropharynx; (2) the ulceroproliferating type, which is likewise superficial; (3) the interstitial or infiltrating types and (4) the invasive types, which destroy the organ by ulceration. Of the total of 23 cured patients 16 had the proliferating type of cancer and 7 the ulceroproliferating type. None of the patients who had interstitial (infiltrating) or invasive cancers were cured.

Ophthalmologica, Basel

105:1-64 (Jan.) 1943

Injury of Trigeminal Nerve by Retro-Orbital Grenade Splinter; New Case. Lieux and R. de Saint-Martin.—p. 1.
Simple Method for Stereoscopic Visualization of Ocular Fundus Using Ordinary Monocular Ophthalmoscope. J. W. Wagenaar.—p. 13.
New Family with Doyne's Discoid Cataract (Cataracta Centralis Pulverulenta). M. Girardet.—p. 24.
*Cholinesterase Content of Eye. R. Brückner.—p. 37.

Eye and Cholinesterase.—Brückner presents investigations on the presence and importance of cholinesterase in the eye, particularly in the aqueous humor and in the vitreous body. Studies on horses and cows revealed that cholinesterase is a regular constituent of the aqueous humor and it is assumed that this is the case also in man. The esterase found in the aqueous probably is derived not from the blood but from other sources. The esterase values of the vitreous body of cows, calves and hogs were several times as high as those of the aqueous humor; in cows it was four times higher than in the serum; in horses the esterase values of the vitreous body were occasionally lower than in the aqueous. In cows the concentration of esterase varied in the different parts of the vitreous; the concentration was greatest in the peripheral zones. The esterase of the vitreous body is probably derived chiefly from the retina.

Bol del Inst. de Clínica Quirúrgica, Buenos Aires

20:521-592 (April) 1944. **Partial Index**

*Prothrombin in Preserved Blood. R. F. Banfi, R. Bay and C. A. Tanturi.—p. 521.
Persistence of Ductus Arteriosus. R. Dambrosi and E. Gobich.—p. 540.
Abscess of Lung. A. S. Lentino.—p. 545.
Use of Vitamin K. C. Morel.—p. 581.

Prothrombin in Preserved Blood.—Banfi and his collaborators found that the time of coagulation and the amount of prothrombin in preserved blood and preserved plasma do not change during the first three days of conservation. The coagulability diminishes slowly but continuously up to a point of final incoagulability of plasma conserved for five months and to which thromboplastin and calcium are added. The amount of prothrombin in the blood and plasma increases during the first three days up to double values in relation to the initial figures. This early increase of prothrombin in the blood and plasma seems to be due to rapid formation of the substance through its sensitization during the process of disintegration of platelets. After the third day prothrombin diminishes down to figures as low as 30 per cent in five months in relation to the initial figures. Transfusion of blood or plasma, when it is preserved for a certain time, is of no therapeutic value in controlling hemorrhage due to hypoprothrombinemia.

Obstet. y Ginec. Lat.-Americanas, Buenos Aires

2:417-512 (June 30) 1944. **Partial Index**

*Pregnancy and Cancer of Cervix. C. Mönckeberg B.—p. 417.
Quadruple Pregnancy. J. Di Bitonto and S. Wilber.—p. 465.

Pregnancy and Cancer of Cervix.—Mönckeberg B. encountered 20 women with cervical cancer among 36,500 pregnant women who were observed in a maternity ward in the course of ten years. All the patients but 2 were under the age of 40. All but 1 were multiparas. They complained of hemorrhage small or moderate, continuous or intermittent. Cancer was recognized during the last half of pregnancy in the majority of the cases. It was of the type of cellular epithelioma in 11 cases. The author advises local examination and biopsy as a routine in pregnant women complaining of hemorrhage during pregnancy. Pregnancy aggravates cancer of the neck, which in its turn predisposes the patient to abortion. Roentgen therapy and radium therapy are interdicted as dangerous for the infant. The author advises the following scheme: (1) Immediate hysterectomy followed by transpelvic roentgen therapy for women with operable cancer before the sixth month of pregnancy, (2) postponement of operation up to full term, abdominal cesarean section at full term and total hysterectomy followed by roentgen therapy and radium therapy in women with operable cancer beyond the sixth month of pregnancy and (3) abdominal cesarean section at full term, and subtotal hysterectomy followed by roentgen therapy and radium therapy in women with inoperable cancer before or after the sixth month of pregnancy.

Book Notices

Global Epidemiology: A Geography of Disease and Sanitation. By James Stevens Simmons, B.S., M.D., Ph.D., Brigadier General A. U. S., Tom F. Whayne, A.B., M.D., Lieutenant Colonel, M. C., A. U. S., Gaylord West Anderson, A.B., M.D., Dr.P.H., Lieutenant Colonel, M. C., A. U. S., Harold Maclachlan Horack, B.S., M.D., Major, M. C., A. U. S., and Collaborators. Volume One. Part One: India and the Far East; Part Two: The Pacific Area. Cloth. Price, $7. Pp. 504, with illustrations. Philadelphia, London, & Montreal: J. B. Lippincott Company, 1944.

This is the first volume of what is no doubt a unique work in medical publication. As a part of the work of the Division of Medical Intelligence in the Bureau of Preventive Medicine in the Office of the Surgeon General, information regarding medical conditions in every area throughout the world has been assembled. The information is here coordinated and presented in such form as to be exceedingly useful to every one concerned with health in far parts of the world. Thus, for Burma there is a discussion of its geography and climate, of the organization of its public health services, its medical facilities, the diseases that are prevalent and the nature of their spread, with a good summary and a bibliography. The major problem of public health in Burma was malaria. Other important diseases are listed. Each of the nations investigated is given similar treatment. The book is handsomely printed in two columns, with large type and many exceedingly useful maps. This is a work of reference which should be available in every medical library and which will be found immediately useful by every physician concerned with disease in any of the nations covered. This is truly an "excursion" into the unexplored field of geomedicine. Now that airplanes have made every section of the world easily accessible, this book serves an immediate need.

Cataract and Anomalies of the Lens: Growth, Structure, Composition, Metabolism, Disorders and Treatment of the Crystalline Lens. By John G. Bellows, M.D., Ph.D., Assistant Professor of Ophthalmology, Northwestern University Medical School, Chicago. Cloth. Price, $12. Pp. 624, with 212 illustrations. St. Louis: C. V. Mosby Company, 1944.

This book is a combination of laboratory and clinical investigations necessary to establish a basis for a more complete clinical understanding of the normal and pathologic crystalline lens. The literature has been thoroughly reviewed, and many theories are presented and discussed without an attempt being made to evaluate all of them. The author has attempted to give the essential scientific facts concerning the embryology, anatomy, histopathology and biochemistry of the lens before going on to the more interesting practical or theoretical conclusions which must be based on this material.

The early chapters are devoted to the comparative anatomy and histology of the crystalline lens. This is followed by a rather thorough discussion of the composition of the lens, which includes all the literature on the chemistry brought up to date. Many analytic tables are included. Thirty-two pages are devoted to the metabolism of the lens and capsular permeability.

The first five chapters with their numerous tables and condensations of many scientific laboratory reports will no doubt be boresome reading for the average clinician, but the effort will well repay any ophthalmologist with an interest in getting below the surface of clinical case reports, as well as any anatomist, chemist or biologist who may have special interest in this important structure.

The last four chapters are of considerable interest to the clinical ophthalmologist. They include a comprehensive discussion on developmental defects of the crystalline lens and contain many case reports. Much space is devoted to cataracts due to radiant energy, electricity, deficiency of some vital constituents and toxins. The discussion on toxic cataracts is important, as such cataracts are being seen more frequently. The chapter on cataracta complicata contains reports of many unusual causes. Stress is placed on endocrine dysfunction as a cause of cataract. The discussion of senile cataract is complete and includes the operative treatment and complications of cataract surgery. This chapter should be of vital interest to the average clinical ophthalmologist.

Physiologic-chemical factors have been dealt with at length, although an attempt has been made to be both systematic and practical in proceeding from the development and growth of the lens to a consideration of its structure. After becoming acquainted with the lenticular composition and metabolism, the reader should be well equipped to appreciate more fully the clinical problems presented in the last five chapters. The arrangement is such that a reader not interested in comparative anatomy, for instance, may pass on to parts of the subject which do interest him. The numerous illustrations are well chosen and contribute materially to the value of the book.

The author has produced an exceedingly interesting and important work, one which will take its place as the authority on the crystalline lens.

Industrial Medicine. Edited by Sir Humphry Rolleston, Bt., G.C.V.O., M.D., K.C.B., and Alan A. Moncrieff, M.D., F.R.C.P. With an Introduction by Air Vice-Marshall Sir David Munro, K.C.B., M.B., Ch.B. Cloth. Price, 16s. Pp. 202, with 5 illustrations. London: The Practitioner by Eyre and Spottiswoode, Ltd., 1944.

This is a handbook, as the title indicates, with various authors contributing chapters on industrial medicine and the general practitioner, industrial poisons, industrial dermatoses, chest disease in industry, miners' nystagmus, toxic anemia, the treatment of the injured workman, backstrain, neuroses in industry, malingering, nutritional problems related to industrial workers, adolescents in industry, fatigue and boredom, lighting problems, ventilation and heating, welfare services, the works ambulance room and factory law in relation to health and welfare.

It is stated in the preface that this book resulted from the interest shown in a small symposium on industrial medicine published in the periodical the *Practitioner*. The subject of each of the chapters apparently was selected on the basis of interest and need for information on these industrial medical problems in the British Isles, miners' nystagmus being prevalent there and nonexistent in the United States. The inclusion of eighteen major subjects in 183 pages makes this a compendium and a convenient reference for those becoming interested in industrial medicine. Because of its brevity, superfluous details are omitted to make it a highly practical book, as each author has handled his assignment ably. The introductory chapter on industrial medicine and the general practitioner, by Air Vice Marshal Sir David Munro, outlines the relationship that should exist between the practitioner and industry and workers, particularly as related to the general improvement of health in industrial areas.

The book should have wide usage by general practitioners because of its practicality.

A Six Year Journey. Published by Cleveland Child Health Association. Leyton E. Carter, Director of the Cleveland Foundation. Paper. Pp. 14, with illustrations. Cleveland, Ohio, 1943.

This is a report issued by the Cleveland Child Health Association of a project begun in 1937 dealing with preschool children. The study began when it was realized that children entering Cleveland's public school kindergartens showed an alarming number of physical defects, which could have been avoided with proper preventive work during the preschool years. There were approximately fifty organized school centers where the children received from almost no care to excellent care. The latter was given only at those centers where the parent paid a fee. There was no uniformity among these various centers. The association then defined through its standards committee the meaning of a "good nursing school." Through the efforts of this association the standards in all centers began to rise. There is now a great need for such centers, and this booklet will be of help to those groups that are planning to form and maintain such centers or schools.

The Experiments of Nature and Other Essays. By Irvine McQuarrie, Ph.D., M.D., Department of Pediatrics, The Medical School, University of Minnesota, Minneapolis. Delivered at the University of Kansas School of Medicine, Lawrence, Kansas. Porter Lectures Series XII. Cloth. Price, $1. Pp. 115, with 16 illustrations. Lawrence, Kansas: University Extension Division, University of Kansas, 1944.

Three scholarly lectures delivered at the University of Kansas School of Medicine in 1942 are included in this book. The first lecture is entitled "The 'Experiments of Nature' and the Advance of Medical Knowledge." The second is on "Diseases of the Adrenal Glands in Children" and the third on "Impressions of Medical Conditions in Besieged China." They are all thoughtful and well illustrated. The first in particular is a well ordered plea for the more careful pursuit of scientific observation in clinical investigations.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MAGNESIUM AND CALCIUM PHOSPHATE CALCULI

To the Editor:—What specific foods in the diet tend to the formation of renal magnesium and calcium phosphate calculi? What part does vitamin A have in the prevention of these formations? If important, what dosage is recommended?

Major, M. C., A. U. S.

ANSWER.—The oxidation of foods within the body results in the formation of an ash. Foods in which calcium, potassium, sodium and magnesium predominate over phosphate, sulfate, chloride and the uncombusted organic acid radicals are called alkaline ash foods. Since phosphatic stones form in urine, which usually has an alkaline reaction, foods which cause this reaction should be restricted. As a general rule, vegetables and fruits are alkaline in their final reaction within the body. As a prophylactic against formation or development of recurrent magnesium and calcium phosphate calculi, Higgins has recommended the high vitamin A acid-ash diet. Restriction of foods with high calcium and magnesium concentration has also been suggested. For more specific information see Renal Lithiasis by C. C. Higgins (Springfield, Ill., Charles C Thomas, 1943) and Dietetics for the Clinician by M. A. Bridges (Philadelphia, Lea & Febiger, 1941). Clinical and experimental evidence has demonstrated the relation between vitamin A deficiency and formation of renal calculi. A vitamin A deficient diet in the white rat for ten weeks usually produces keratinization of urinary tract epithelium, for example, of the kidney pelvis. Desquamation of the epithelium and keratinization may cause sufficient irritation to produce the initial lesion, while elaboration of fibrin forms a framework for deposition of crystalline sediment and subsequent development of a calculus. The daily requirement of vitamin A is estimated to be between 6,000 and 8,000 international units for the growing child and 6,000 international units for the adult. Biophotometer tests may be utilized in management of patients with renal lithiasis to determine the response to dosage administered.

MENSTRUATION AND CLIMATE

To the Editor:—I have a 17 year old patient who menstruates every twenty-eight days when the weather is cold and every fourteen to seventeen days as soon as the weather becomes warm. This is the third summer that it has occurred. The menses started at age 13 and have been regular otherwise. The flow is moderate for five days. What, if any, is the effect of climate on the menses?

Morris Weinstein, M.D., Irvington, N. J.

ANSWER.—There are many circumstances which can alter the periodicity of the menstrual flow. Among them are marriage, pregnancy and labor, change of climate, change of occupation, illness and mental or physical shock. The exact effect of climate on the menses has not been agreed on. Thus, while it is generally believed that in countries where the temperature is high most of the time the onset of menstruation occurs earlier than in countries of moderate or low temperature, this belief has not been definitely proved by statistics. Usually change of climate and change of temperature produce an amenorrhea rather than an alteration in the frequency of the menses. The case cited is unusual, but the occurrence does not mean that there is anything wrong with the patient. Treatment is not necessary.

SUTURES FOR HERNIOTOMY

To the Editor:—A few patients who have had recent herniotomies have told me that their periods of stay in the hospital were only one week. Apparently there have been no recurrences of the hernia. In order to discharge hernia cases so soon is there any special suture or unusual type of stitch required?

Ranson B. Baker, M.D., Rawlins, Wyo.

ANSWER.—Generally speaking, there are three types of sutures utilized in the repair of hernia: (1) the absorbable type represented by catgut, (2) the unabsorbable type represented by fine silk or cotton and (3) the fascial type. Most surgeons still adhere to the absorbable type, some preferring chromatized catgut because of its slow absorption. The silk suture is probably more reliable but requires the mastery on the part of the surgeon of an especially fine technic as advocated by Halsted. Of late there has been a renewed interest on the part of some surgeons in the use of autoplastic fascial repair. McArthur, Gallie and LeMesurier advocated long ago the use of both living and dead fascial strips for the repair of inguinal hernia. They have demonstrated in experiments and from microscopic studies that autoplastic suture heals and lives in situ; it is not absorbed and does not slough. McArthur's technic consisted in splitting a strip from the aponeurosis of the external oblique without detaching it, threading it onto a needle and accomplishing the Andrews imbrication operation with it. If one was to rely for his results on the suture rather than on the method, the autoplastic fascial suture of McArthur is undoubtedly the most reliable. However, the technic is rather clumsy and difficult and time consuming.

Regardless of the type of suture used, the tendency is not to permit patients early rising after an inguinal herniotomy. The success of the operation depends on the proper healing of the coapted layers.

RESTAURANT SANITATION AND CHIPPED CHINA

To the Editor:—The Columbia County Department of Health is interested in promoting publicity for good restaurant sanitation. The elimination of the many and increasing number of cracked and chipped cups in our restaurants was one of our objectives. We hesitate to do anything further about this after seeing the August issue of *Hygeia*. On page 629 is a full page advertisement by the War Advertising Council with the title "The Chipped Teacup of the Patriotic Mrs. Jones." Is it your opinion that the danger of transmission of disease through cracked and chipped cups is of greater or lesser significance than the conservation of materials during wartime? We are trying in our community to maintain good sanitary conditions in spite of lack of materials and regret the appearance of this particular advertisement in the more popular magazines. While this particular advertisement relates to home use of cracked teacups, we believe it could easily be misinterpreted.

Sue Hurst Thompson, M.D., Hudson, N. Y.

ANSWER.—From the esthetic point of view the use of chipped or cracked table ware is to be discouraged. In the presanitary days, when but limited attention was given to cleansing and disinfection, the crevices of chipped dishes were packed with particles of food and living bacteria. While it is possible to sterilize chipped or cracked dishes, few eating places carry out adequate disinfection so as to eliminate the menace of the chipped utensil. Even though replacements are now difficult, most health authorities, for the protection of the people, prohibit the use of chipped table ware.

DISCOLORATION OF TEETH FROM ERYTHROBLASTOSIS FETALIS

To the Editor:—About two years ago I had occasion to see 3 newborn infants, not related, with erythroblastosis fetalis. These infants were given repeated transfusions of Rh negative blood until the hemoglobin and red cell count ceased to drop. They were dismissed from the hospital with an iron compound added to the daily formula. In all 3 infants the iron was discontinued several months before the eruption of the first teeth. When the deciduous teeth erupted they were all deeply discolored with a grayish green pigment which seemed incorporated in the tooth structure instead of being on the tooth surface. The teeth were otherwise normal and the babies have since developed normally physically. Can you give me any explanation for this discoloration? Is it related to the iron in the formula or to the erythroblastosis?

M.D., California.

ANSWER.—The discoloration of the deciduous teeth in these cases probably resulted from erythroblastosis fetalis and was caused by excessive amounts of blood pigments that were deposited during the prenatal formation of the enamel and dentin of the deciduous teeth. The deposition of endogenous pigments in the enamel and dentin during their formation and calcification has been reported in uroporphyria and in icterus neonatorum. It is possible but doubtful that the exogenous iron given during the postnatal period contributed to the pigmentation. In iron therapy the deposits of stain are present on the surface of the tooth rather than within the enamel and dentin.

ANESTHESIA FOR CESAREAN SECTION

To the Editor:—In Queries and Minor Notes in the July 29 issue of The Journal there is a question entitled "Anesthesia for Cesarean Section in Women with Myocarditis and Renal Disorders." Long experience has taught me that a great deal more anesthesia is given during the ordinary cesarean section than is at all necessary. In my service at the Graduate Hospital of the University of Pennsylvania the rule is to prepare the woman's abdomen and catheterize before any anesthesia is given. The anesthetic is started when everything is ready to make the incision. As soon as the patient is unconscious the incision can be made and the baby extracted under a wonderfully small amount of anesthesia. If this practice is followed, instead of anesthetizing the woman thoroughly before the abdominal preoperative preparation is made it will be found that the child does not have to be resuscitated—in fact, it cries just as readily as though the operation had been done under local or spinal anesthesia.

William R. Nicholson, M.D., Philadelphia.